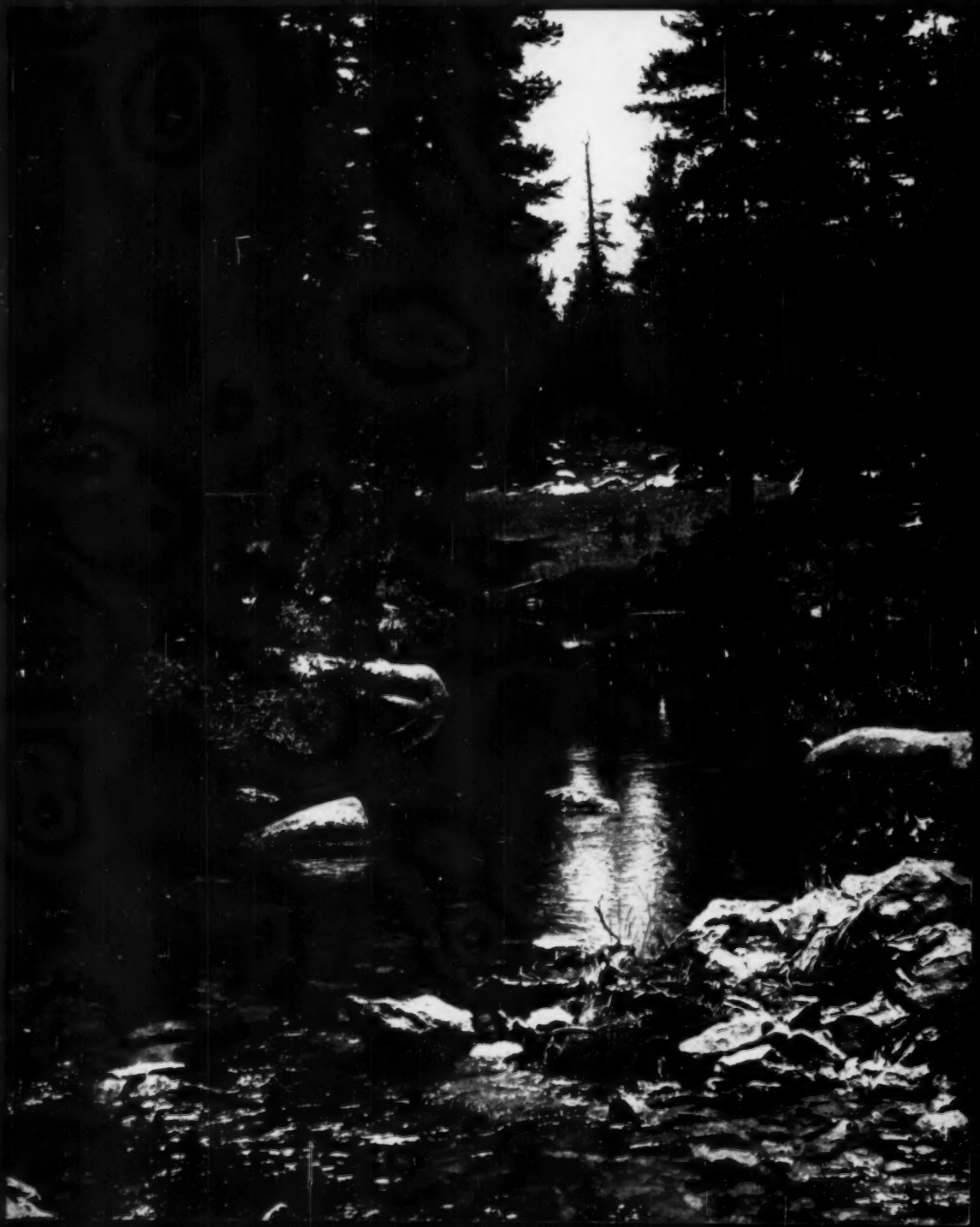
Journal of

FORESTRY

AUGUST 1953



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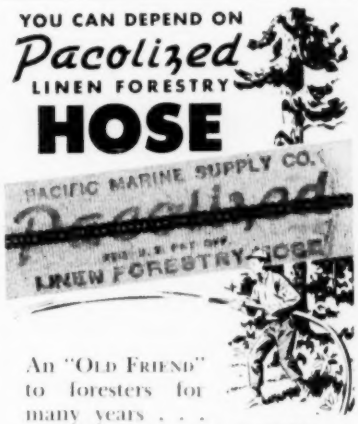

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Publication office, 825 Mills Building, 17th Street at Pennsylvania Avenue N. W., Washington 6, D. C. Address all correspondence concerning editorial or business matters to JOURNAL OF FORESTRY, 825 Mills Building, 17th Street at Pennsylvania Avenue N. W., Washington 6, D. C. Published monthly. Subscriptions $7.50 per year; single copies 75 cents. Missing numbers will be replaced without charge provided claim is made within thirty days after date of the following issue.

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Photo U. S. Forest Service.

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Journal of Forestry

Official Organ of the Society of American Foresters

Forests and Trout

Fred W. Johnson
Division of Range and Wildlife Management, Northern Region, U. S. Forest Service, Missoula, Mont.

Forests and trout are closely related. In fact, continued productivity of many trout streams depends mainly upon good management of the forests on trout stream watersheds. Fishing on trout waters is steadily and rapidly increasing, so these streams are becoming more and more important as a recreational resource. Foresters as land managers have a key responsibility in maintaining and developing this resource.

Trout are closely related to the land and to forests because their basic food chains originate in plants which in turn live upon nutrients drawn from the soil. Moreover, the spawning beds, which serve as a nursery for countless millions of trout fry every year, are part of the land.

Trout Reproduction Not a Problem

Fishery investigators everywhere are coming to the conclusion that the major problem in trout management is not how to reproduce the fish but how to create and maintain a suitable habitat for them.

Early fish biologists considered natural reproduction of trout ineffective, but subsequent research has proved it to be so efficient that only a small part of the natural stock produced every year can survive. Numerous stream studies from East to West show that most trout populations and catches are composed of a high percentage of wild trout. This success of natural reproduction and survival of young trout in Michigan streams are described by Hazzard (*3*): "The abundance of naturally spawned trout 'fry' visible in the spring of the year in the feeder streams, and in suitable areas along the margins of larger trout streams, is further evidence of successful reproduction. Experiments with these wild fish have shown that they also suffer a high mortality before reaching legal size simply because the stream cannot support all of the young produced."

Studies such as Hazzard's indicate the high productive potential of many streams. However, the capability of each stream as a trout hatchery, and the success in rearing enough fish to fully stock the stream are dependent upon the quality of the habitat. Thus while the process of natural reproduction is normally successful, foresters should realize that favorable environment is the major factor contributing to this success. This does not mean to preclude the use of hatchery-reared fish. Trout plantings are needed in barren habitat, in places where spawning is not successful because of limiting environmental factors. In some heavily fished waters where wild trout become exceptionally wary of lures presented, plantings of hatchery-reared trout are used to supply a more catchable trout.

Trout and the Land Manager

Briefly, the major job of land managers in the field of inland fisheries management is to maintain the proper balance between water environment and adjacent land environment. This job, for the most part, must be done during land-use operations. Although a part of the job is to restore damaged watersheds, emphasis should also be placed upon preventing damage, and enhancement of the environment for fish.

Two important and related phases of watershed management affect trout streams. First, there are the problems of soil erosion and floods on the entire watershed. Then, more specifically, come the questions of the stream-edge vegetation, its influence, and its protection.

Trout, Soil Erosion, and Floods

Trout and soil erosion do not go together. Although trout can and do survive in silted streams, they have great difficulty in increasing or even maintaining their numbers.

Silting slows down natural reproduction by smothering fertilized trout eggs. Moreover, the scouring action of abnormal floods may lower the channel or create by-pass channels, leaving trout spawning beds high and dry. Hobbs' (*4*) studies in New Zealand indicate that silt may destroy as much as 11 percent of the trout eggs deposited. Normal high waters in spring do not usually result in serious losses because trout are very selective in locating safe spawning areas.

Abnormal floods also reduce food reproduction and destroy shelter. The important food-producing riffle sections may be smothered with silt that fills in the spaces between the rocks, thus eliminating the homes of many aquatic insects. During floods, rich, mucky, quiet backwaters are swept away and heavier, light-colored inorganic silt with poor food-producing qualities is left. Further, the pools needed for shelter by trout may become filled with silt, and increased lateral ero-

sion may widen them into shallow flats which may become too warm for trout during hot summer days.

The shelter provided by overhanging grassy banks and shrubs may likewise be destroyed by the scouring action of abnormal floods. In the northern Rocky Mountain region, much of the silt load carried by streams at flood stage is the result of lateral erosion of the stream banks.

Many trout streams in the national forests of Idaho and Montana have deteriorated because of accelerated erosion following fires. Such deterioration is still going on in some streams. The St. Regis River, the Vermillion River, and Big Beaver Creek in the Cabinet National Forest of Montana are not good trout streams because erosion and downstream movement of unstable rock, gravel, and silt are continually changing the channels. Big Beaver Creek is filled with a mass of eroded boulders, and in summer this former trout stream now percolates underneath five miles of rock rubble instead of flowing over the surface.

Trout and the Stream Edge

The stream edge and its vegetation are as much a part of the trout stream environment as the stream bed and the water itself. Providing shade, cover, and protection for stream banks and channels are important functions of stream-edge vegetation.

Shade and temperature.—Many fishery workers believe that stream temperature is the most important single factor of the trout environment. Stream temperatures are modified through the shade of stream-side vegetation.

Several years ago, Lindh (*6*) described a stream-edge cutting policy for timber sales on the national forests of the northern Rocky Mountains region. This provides for leaving uncut strips of timber along trout streams and their tributaries to provide shade, as well as to preserve a suitable recreational environment.

Greene (*2*) has described the physical effect of shade on trout stream temperatures on the Coweeta Experimental Forest in North Carolina. He writes: "Trout streams are frequently in such delicate balance near the upper limit of tolerance that a slight increase in temperature would render them unfavorable to brook trout. . . . Because the absence of shade can exert such significant effects upon stream temperatures, it is evident that careful manipulation of riparian vegetation can be a means of maintaining optimum temperatures necessary for the growth and development of trout, and the aquatic organisms upon which they feed."

Cormack (*1*) has described the effects of removing stream-side vegetation in Canadian forests upon the trout streams of southeastern Alberta. He states: "From evidence obtained in present surveys, one measure of stream protection that seems most desirable would be the prohibition of all cutting along wide strips on both sides of the stream. There is considerable precedence for advising a policy of this kind, as multiple use forestry admits non-cutting in certain areas if it is genuinely needed. . . . The width of the strips to be left uncut will undoubtedly vary with the individual stream, and with the type of forest cover. Taking conditions of the Carbondale River valley as more or less general for this part of the watershed, the writer suggests as a beginning point a strip of at least 60 feet on each side of the stream. Certainly the uncut areas should be wide enough to provide the maximum of shade and protection on both sides of the stream. Also, they should be extensive enough to include the stream sources, springs and small feeder tributaries."

Control of shade is, however, a matter of local ecology. For example, total protection of stream-edge environments as advocated by Cormack for Alberta streams may or may not be necessary for stream temperature control in the northern Rocky Mountain region. Shrubs growing on stream banks following logging operations on national forests in Montana and Idaho often provide all the shade necessary.

Other observations made by the writer on timber sale areas on the upper reaches of Smith River in August 1950 indicate that low stream temperatures, which are due in part to the shading effects of undisturbed stream-side vegetation, may be important in maintaining favorable temperatures farther downstream. Sale area stream temperature was 46°F., while downstream temperature of the Smith River in the valley below was 72°F. the same day. Had upstream temperatures been higher as the result of shade removal it is possible that much of the downstream section of the Smith River would have been unsuitable for trout. Smith River is a highly productive trout stream tributary to the Missouri River above Great Falls in the plains country, where summer temperatures are typical of continental climates.

Cover or shelter.—Cover requirements for trout vary with the size of streams. It is obvious to trout fishermen that trout in our smaller streams often require stream-bank cover as part of their habitat. However in large streams deep water and surface turbulence are in themselves cover.

One interesting evaluation of trout stream cover has been related to the writer by Charles Phenicie (*7*) who has been conducting the Prickly Pear Test Stream Study carried on by the Montana State Fish and Game Department. Phenicie determined by means of an electric shocker that far more trout were occupying willow-bordered reaches of this stream than were found in adjacent and identical reaches where willows and other stream-side trees and brush had been killed as a result of overgrazing by cattle and cutting by beaver.

Protection against erosion.—A good trout stream should have a considerable area of moderately deep water. Stream-bank vegetation helps to maintain such areas through the reduction of lateral erosion. Strips of timber left along stream banks do more than shade trout waters; they provide this needed protection against lateral erosion. Moreover, they also serve

as buffers that arrest silt flows from skid trails and logging roads. During summer rainstorms, the writer has observed that silt flows fan out within 20 or 30 feet after entering the undisturbed mat of pine needles and other forest litter.

New Trend in Watershed-Stream Management

Habitat improvement.—The influence of watershed management in modifying stream flows and stopping soil erosion and siltation is being recognized more and more. The trend of trout fisheries management projects now being undertaken by the Fisheries Division of the Michigan Department of Conservation is an outstanding example of this and is of special interest to land managers. In "The Rifle River Watershed Development Program" the watershed is being treated as the first measure in the process of restoring and improving trout stream environments. As a general statement of the problem, Tody (9) states: "It has been realized for some time that the present form of stream improvement has some technical shortcomings, and that probably the utmost benefit to total fish production is not achieved. In the past, and at the present, stream improvements in the form of deflectors, digger logs, various types of cover, etc., are installed on waters where they are needed to support a yield of trout under present conditions of heavy fishing pressure. Such improvements are necessarily installed on a piecemeal basis, as the entire waters of the state must be considered in the program. It is readily apparent in any analysis of stream improvement, however, that unless the contributing factors of fish habitat destruction are removed or controlled, the streams cannot be placed on the highest production level."

Watershed and stream restoration work on the Rifle River project includes reforestation, streambank stabilization, and improved farm practices in cooperation with farmers and the Soil Conservation Service to minimize soil erosion. Small reservoirs have been constructed as a means of charging the glaciated soils of the watershed in order to augment the supply of cold water to the Rifle River.

Logging methods.—The forester must deal with steep slopes, narrow canyon bottoms, and a wide variety of soils and parent materials. In such areas of rough terrain it is difficult to properly locate logging roads, and to manage cutting operations so as to protect the watershed. However, good logging operations are possible under such conditions and the writer has seen some outstanding examples of good practice. A typical one is the Stoney Creek Sale on the Kanisku National Forest in Idaho. Here very steep slopes sometimes exceeding 60 percent are being logged, yet little silt is being contributed to streams. Logging practices include (1) the use of small jammer skidders which handle short logs and (2) keeping skidding distances short by spacing haul roads close together and frequent moving of the loaders.

Closer attention is also being given to the effects of logging road locations and construction in relation to trout streams. On the Coeur d'Alene, another Idaho National Forest, Roffler (8) has reported a study of logging road systems 5 to 10 years after logging operations were completed. This report, a summary of which follows, states the local conditions involved in logging road drainage maintenance as related to stream management. "In Stewart Creek a small side stream was damaged due to the failure of the culvert. The road fill was badly eroded, which filled the channel with silt and rock, causing culverts or road crossings below to fail, and add additional silt and rock. The resultant action caused gouging of the stream bed. It was a very small stream, and the erosive effects were soon dissipated as the stream joined others. However, were the same thing to occur in a larger drainage, the results could be devastating. Observations indicate the following practices should be encouraged in road construction on sale areas:

1. Keep road grades to absolute minimum through adequate planning and scouting of routes. Maximum grades of 8 percent would be desirable.

2. Keep locations out of stream bottoms.

3. Clear right-of-way to adequate width. Keep debris, and particularly stumps, out of edge of fill so road can be properly outsloped for drainage.

4. Provide adequate drainage at draw and stream crossings. Plan for increased runoff after logging. After logging, remove fills from draws where permanent structures are not required."

Throughout the Northern Region of the Forest Service, the question of peak waterflows that may follow logging in high-water-yield areas greatly influences foresters in planning cutting cycles and cutting areas. The foresters try to plan cutting so as to permit effective reforestation, and avoid any serious upset in the normal runoff. Experience in this region indicates that this is especially important in clear-cutting stands of lodgepole pine.

Influences of stream environment gaining recognition.—Stream environmental improvement and protection are being recognized as the most practical way of helping to maintain highly quality of sport fishing, and increase trout stocks. Environmental improvement in all its phases, and as a part of land management, is gaining headway, not only among fisheries workers, but among sportsmen as well. Recent Federal legislation (such as the Water Pollution Control Act of June 30, 1948, and the Dingell-Johnson Act) firmly supports this opinion.

As this interesting field of work grows, new forest management practices will be developed and directed to watershed-fisheries relationships. Eventually fishery workers may determine the relationship of the tons of lime, nitrogen, and other minerals contained in the litter of forest watersheds to trout stream fertility, as Kittredge (5) has described the importance of forest litter to the fertility of forest soils. Eventually, also, the ma-

jor contributions of the forester in providing sound silvicultural practices, effective forest fire protection, and good watershed management will be more fully recognized by fishermen as the necessary background for inland fisheries work.

Summary

In most trout streams, we depend greatly upon natural reproduction to maintain trout fishing. Success of natural reproduction of trout is closely associated with proper watershed management.

Most fishery workers agree that, aside from wise regulation of the fishing, the most important features of trout stream management are: (1) to prevent silting; (2) to regulate the flow evenly; (3) to maintain proper water temperatures; and (4) to provide suitable cover.

Most trout streams are in forest areas. Here the prevention of silting and abnormal water levels, as well as the maintenance of water temperature and cover, depend upon proper watershed protection and stream-side forest practices.

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Junior	4,048	4,318
Student	720	723
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Corresponding	56	61
Honorary	13	13
	8,905	9,463

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3. Central Rocky Mountain	14	278	93	134		4	4	43
4. Central States	4	637	322	189	2	11	12	101
5. Columbia River	2	853	438	316	4	30	12	53
6. Gulf States	6	632	289	223	2	75	15	28
7. Inland Empire	17	195	100	67	1	9	3	15
8. Intermountain	19	186	69	103		2		12
9. Kentucky-Tennessee	20	179	74	87		8	5	5
10. New England	8	577	233	243	4	46	19	32
11. New York	10	385	149	174	4	11	15	32
12. Northern California	3	740	338	285	8	42	22	45
13. No. Rocky Mountain	18	194	83	88	1	2	1	19
14. Ozark	13	330	144	113	1	40	4	28
15. Puget Sound	9	303	221	181	4	35	8	54
16. Southeastern	1	879	532	234	2	30	15	66
17. Southern California	21	119	54	42	2	9	3	9
18. Southwestern	16	210	105	87		9	2	7
19. Upper Miss. Valley	12	364	146	140	1	13	7	57
20. Washington	15	267	51	172	11	2	27	4
21. Wis.-Upper Michigan	11	376	166	157	2	28	13	10
No Section Affiliation[1]		245	122	116	5	1	1	-
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Strength and Related Properties of Second-Growth Port Orford White-Cedar

J. R. Stillinger

In charge, Timber Mechanics Section, Oregon Forest Products Laboratory, Corvallis, Ore.

OLD-GROWTH stands of Port Orford white-cedar [*Chamaecyparis lawsoniana (A. Murr) Parl.*] are rapidly diminishing. The increased demand for battery separators during the second World War accelerated the rate of depletion. The 1947-49 Forest Service Reinventory Survey of the five southwestern Oregon counties—Coos, Curry, Douglas, Jackson, and Josephine—estimated a live timber volume of 1,688 million board feet, log scale, Scribner rule, in trees 11.0 inches d.b.h. and up, and a primary growing stock of 264 million cubic feet. The estimates were based, however, on a small sampling plan and are therefore subject to error.

Table 1 presents the Port Orford white-cedar log production in Oregon from 1925 to 1946. In 1949, 1950, and 1951, however, the average annual cut dropped to 15,000 M board feet or less. The demand for second-growth wood has been comparatively small, and even that for old-growth has slackened considerably since the war, because other species and substitute materials are being used in the manufacture of battery separators, the major outlet. Although the species grows equally well on sites that are considered either good or poor for Douglas-fir, the wisdom of propagating the species cannot be reliably determined until the properties of the second-growth wood are known. The data in this report may aid in evaluating the potentialities of the second-growth wood.

TABLE 1.—ANNUAL LOG PRODUCTION OF PORT ORFORD WHITE-CEDAR IN OREGON, 1925-43 AND 1945-46[1]

Year	M board feet log scale	Year	M board feet log scale
1925	63,160	1935	47,955
1926	73,800	1936	30,731
1927	78,140	1937	71,848
1928	65,210	1938	41,978
1929	67,915	1939	54,946
1930	39,325	1940	52,824
1931	19,884	1941	61,716
1932	4,165	1942	55,074
1933	6,034	1943	56,682
1934	36,238	1945	40,587
		1946	24,170

[1]Source: Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

Objectives

The major objectives of the project were:

1. To carry out the following strength and related property tests for both green and dry second-growth Port Orford white-cedar: static bending with center point loading, compression parallel to the grain, compression perpendicular to the grain, horizontal shear, cleavage, tension perpendicular to the grain, hardness, toughness, shrinkage, specific gravity, and direct withdrawal resistance of an 8d box nail.

2. To determine if significant differences in these properties exist among three growth-rate classes.

3. To study the variation in specific gravity caused by orientation within the tree.

Experimental Procedure

The experimental work was divided into four phases: preliminary survey, collection of test material, preparation of test specimens, and physical testing.

Preliminary Survey

In October 1949, representatives from the Oregon Forest Products Laboratory, Corvallis, Oregon; Pacific Northwest Forest and Range Experiment Station, Portland, Oregon; Forest Products Laboratory, Madison, Wisconsin; and Siskiyou-Cascade Research Center, Roseburg, Oregon, spent two days inspecting typical old-growth and second-growth stands of Port Orford white-cedar in Coos County, Oregon. Trees growing in pure, mixed, open, and dense stands were observed, and increment borings were made to determine the age of trees representing different growth conditions.

Collection of Test Material

Examination of the increment borings suggested the arbitrary establishment of three growth-rate classes, based on the number of rings per inch: fast (8 or less rings), moderate or average (9 to 16 rings), and slow (over 17 rings).

Standard testing procedure (*1*) recommends the selection of at least five representative trees from each species. It seemed advisable, however, to choose four trees from each growth-rate class or a total of 12 trees. In November 1949, Mr. George A. James of the Siskiyou-Cascade Research Center located and marked 12 test trees in southeastern Coos County and northwestern Curry County.

After the individual test specimens were cut from the trees, however, it was found that the specimens from any tree might fall into two, maybe all three, classifications. It was, therefore, decided to classify each specimen according to its individual ring characteristics, regardless of the growth-rate classification of the source tree.

Preparation of Test Specimens

The preparation of test specimens comprised the following steps: cutting trees into bolts, transportation and storage of bolts, and cutting test specimens.

Cutting trees into bolts.—The test trees were felled and bucked into bolts in December, 1949. Each tree was numbered, and its north side clearly marked with a blaze before felling. A slight deviation from the standard procedure for locating test bolts was followed. In two of the four trees in each growth-rate class, only the *b* bolt (A.S.T.M. bolt designation) was cut. In the remaining two trees, a bolt was cut at each 16-foot interval of length beginning with the *b* bolt. As soon as each test bolt was cut from the tree, it was marked with a blaze designating the north

side, and a metal tag bearing the tree number and bolt letter was nailed to each end of the bolt.

Transportation and storage of bolts.—The bolts were loaded onto a truck, soaked with water, covered with a heavy tarpaulin, and hauled to the Oregon Forest Products Laboratory. They were stored outside under a tarpaulin, and watered periodically prior to and during the cutting into test specimens.

Cutting test specimens.—Using the designated north point as a base, the smaller end of each bolt was marked off into quadrants and each quadrant correctly designated as NE, SE, SW, or NW. Cardboard templets approximately 2½ inches square were laid on the small end of the bolt to locate the position of standard 2 by 2 by 30-inch static bending test specimens (Fig. 1). Each specimen was marked with numbers and letters designating its source. For example, the designation 5BNW2 showed that the specimen came from No. 5 tree, "*b*" bolt, northwest quadrant, and was cut near the bark. If the last digit was "1," the specimen was cut near the pith. An effort was made to get the maximum number of specimens from each bolt. The number obtained depended upon the diameter of the bolt, and the location of knots and other defects not permitted in standard specimens.

All specimens cut from the NE and SW quadrants were arbitrarily designated for testing dry, those from the NW and SE quadrants for testing green. After cutting, the green test specimens were submerged in water in large wooden tanks. The dry test specimens were carefully dried in a small experimental dry kiln to approximately 12 percent moisture content. On removal from the kiln, they were placed in a controlled temperature and humidity room (70° F. and 65 percent relative humidity) to bring the material to an equilibrium moisture content. The test specimens were kept in the wooden tanks or control room until time of testing, then removed, surfaced, and the markings renewed.

The 1 by 4 by 1-inch radial and tangential shrinkage specimens were cut from part of the residual material. These were stored in water prior to carrying out the tests. Standard 2 by 2 by 8-inch compression parallel to the grain test specimens were also cut from this residual material. These specimens were stored, dried, and conditioned in the same manner as the static bending specimens.

Standard shear, cleavage, tension perpendicular to the grain, compression perpendicular to the grain, toughness, hardness, moisture content, and specific gravity test blocks were all obtained from the uninjured ends of the fractured static bending test specimens.

The test specimens for the direct withdrawal nail-holding test were taken from any leftover material.

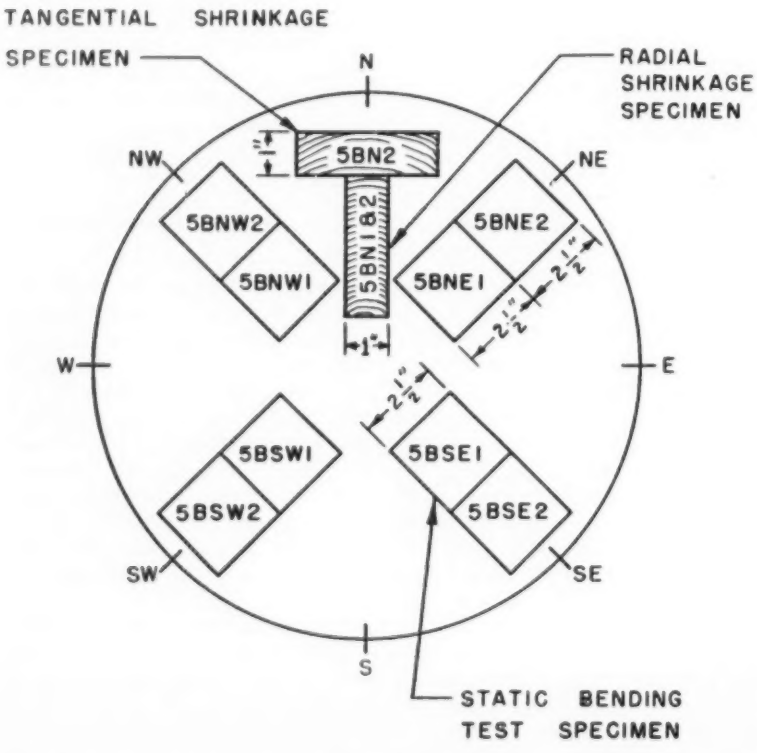

FIG. 1.—Position of test specimens within the B bolt of tree No. 5 and the method of marking individual test specimens.

Physical Testing

A 20,000-pound Tinius Olsen electro-mechanical testing machine was used for all tests in the investigation, except shrinkage, specific gravity, moisture content, and toughness. The machine was calibrated by an engineer from the manufacturer. His findings showed that for loads over 200 pounds the expected precentage error for the range of the machine was within plus or minus one percent of the indicated reading.

Standard testing procedure (*1*) was followed precisely in the tests for static bending, compression parallel and perpendicular to the grain, shear parallel to the grain, cleavage, tension perpendicular to the grain, hardness, radial and tangential shrinkage, specific gravity, and moisture content.

Since the Oregon Forest Products Laboratory did not have a toughness testing machine, the U. S. Forest Products Laboratory at Madison, Wisconsin, was asked to run the standard toughness tests.

No widely accepted procedure had been devised for a direct withdrawal resistance nail-holding test,

so one was used that had proved satisfactory in a previous nail-holding study (5) at the Oregon Forest Products Laboratory. The test blocks were held in a small vise that was attached to the movable cross-head of the testing machine. The jaws of the vise were finely grooved to reduce the force necessary to hold the test specimens without slippage. A steel bar, shaped in the form of a hammer claw, was fastened to the fixed cross-head of the testing machine. A head speed of 0.5-inch per minute was used in pulling the nails, since previous tests at the Oregon Forest Products Laboratory had shown no significant difference in the direct withdrawal resistance of nails at head speeds of 0.05 to 1.00 inches per minute.

Discussion and Results

Comparison of Second-growth and Old-growth Wood

Table 2 gives the average property values for both green and dry second-growth Port Orford white-cedar and the statistical significance of the average values. Previously determined, average property values for old-growth Port Orford white-cedar also are shown (3). Although it is inadvisable to make direct comparisons between the old-growth and second-growth values because of differences in number and location of test trees, and in average specific gravities, nevertheless, the following com-

TABLE 2.—AVERAGE PROPERTY VALUES AND STATISTICAL SIGNIFICANCE IN THREE GREEN AND DRY GROWTH-RATE CLASSES OF SECOND-GROWTH AND AVERAGE VALUES IN OLD-GROWTH PORT ORFORD WHITE-CEDAR

Property	Green moisture condition				Dry moisture condition[1]				Conclusions resulting from statistical significance test among growth classes.
		Second growth				Second growth			
	Old-growth	Slow	Average	Fast	Old-growth	Slow	Average	Fast	
Specific gravity[2]	0.392	0.389	0.390	0.369	0.400	0.420	0.412	0.399	Fast: lower in green and dry compared with pooled slow and ave.
Stress at proportional limit bending (psi)	3980	3471	3343	3058	7970	6618	6439	6244	Fast: lower in green and dry compared with pooled slow and ave.
Modulus of rupture (psi)	5840	6452	6261	5759	10990	11861	11081	10598	Fast: lower in green and Slow: higher in dry
Modulus of elasticity (1000 psi)	1375	1256	1228	1064	1634	1594	1496	1372	Fast: lower in both green and dry
Work to proportional limit (in. lb./cu. in.)	0.68	0.55	0.52	0.50	2.20	1.56	1.56	1.60	No difference in green or dry
Work to maximum load (in. lb./cu. in.)	7.20	7.72	7.11	6.93	8.00	11.71	9.40	7.82	No difference in green Slow: higher in dry
Compression perpendicular to grain (psi)	332	265	296	275[4]	931	720	753	833	No difference in green or dry
Compression parallel max. crush. strength (psi)	3040	3062	3032	2651	7240	6022	5944	5757	No difference in green or dry
Compression parallel-proport. limit stress (psi)	2650	1922	1929	1583		3897	3755	3621	No difference in green or dry
Shear parallel to grain (psi)	808	792	796	841	924	1497	1514	1434[4]	No difference in green or dry
Cleavage (lb./in. of width)	78	162	177	166[4]	215	124	165	218	No difference in green All different in dry
Tension perpendicular to grain (psi)	142	239	272	315	390	180	187	192	No difference in green or dry
Toughness (radial inch-pounds		331	275	306[4]		209	179	158[4]	No difference in green or dry
Toughness (tangential inch-pounds)		372	370	417[4]		267	242	238[4]	No difference in green or dry
Hardness end (lbs.)	414	457	447	444[4]	707	770	750	749	No difference in green or dry
Hardness side (lbs.)	354	406	392	380	528	542	542	589	No difference in green or dry
Shrinkage radial (percent of green dimensions)	4.2	4.3	3.9	3.8	—	—	—	—	Slow: higher
Shrinkage tangential (percent of green dimensions)	6.3	6.2	6.9	6.8	—	—	—	—	No difference
Nail holding direct withdrawal side (lbs.)[3]	—	234	234	214	—	280	297	231	No difference in green or dry
Nail holding direct withdrawal end (lbs.)[3]	—	112	108	96		140	162	152	No difference in green or dry

[1]Test specimens brought to equilibrium with temperature of 70° F. and relative humidity of 65 percent. Average moisture content reached was 13.5 percent.
[2]Oven-dry weight and volume at test.
[3]Depth of penetration 1¾ inches.
[4]Less than five test specimens per average value.

parisons[1] between second- and old-growth wood of comparable specific gravity appear well-grounded:

1. The green, old-growth wood appeared to have higher values in modulus of elasticity, and compression perpendicular to the grain with lower values in modulus of rupture, cleavage, tension perpendicular to the grain, and hardness.

2. The dry, old-growth wood appeared to have higher values in modulus of electricity, maximum crushing strength, compression perpendicular to the grain, and tension perpendicular to the grain, but lower values in shear parallel to the grain, and hardness.

3. In all other properties, the differences between old-growth and second-growth were so small as to be indefinitive.

Comparison of Growth-rate Classes in Second-growth Wood

The test data for the three growth-rate classes were compared by the analysis of variance method to determine if significant differences in the properties investigated occurred among the growth-rate classes. With a material that varies as much as wood, it is inadvisable to summarize differences in average values without considering the normal expected variation. The summary statements in the last column of Table 2 will be correct 95 percent of the time in this type of analysis.

Most of the properties investigated showed no significant difference among the three growth-rate classes. Shrinkage decreased with an increase in growth-rate, which was to be expected because of the concurrent decrease in specific gravity. This investigation produced evidence that modulus of rupture and modulus of elasticity were lower in the fast-grown wood, and also that work (a measure of shock resistance and toughness) was reduced with increased growth rate, particularly in the dry samples. Cleavage values exhibited an interesting relationship: no pronounced differences were found among green specimens, but an increase in growth-rate caused a definite increase in resistance to cleavage in dried specimens.

Position of Test Specimens Within a Tree

Specific gravity of specimens may vary with their position in the tree; it is affected by location with respect to the longitudinal axis, distance from the pith, and transverse location with respect to cardinal directions (Fig. 1). Recognizing these sources of variation, the experimental design was constructed to facilitate the evaluation of possible differences. An analysis of variance indicated that the transverse quadrant position (NE, SE, SW, and NW) had no significant effect upon specific gravity, in this particular experiment. On the other hand, specific gravity of test specimens located near the pith (Fig. 1) was significantly higher than that of specimens near the bark. Along a common longitudinal axis, specific gravity decreased gradually from the base of the tree to the top. The specific gravity of the *b* bolt was significantly higher than that of all other bolts under test, while that of the *r* bolt was significantly lower. There was no significant difference among the *f*, *j*, and *n* bolts (Table 3).

General Observations

Other Properties of Port Orford White-cedar

Cutting the test bolts into test specimens revealed the following characteristics:

1. Most test bolts had 10 to 15 percent sapwood.

2. The moisture content of the green sapwood averaged about 200 percent, that of green heartwood 40 percent.

3. No pronounced line of demarcation existed between springwood and summerwood.

4. Knots were comparatively small and tight.

5. Surfacing with a Buss planer produced a smooth, uniform finish with little torn grain.

6. There was little or no tendency to splinter during sawing.

Potential Uses for Port Orford White-cedar

1. Boxes, baskets, and crating.
2. Flooring.
3. Furniture.
4. Sashes, doors, and general millwork.
5. Ship and boat building.
6. Interior panelling and finish lumber.
7. Shuttles, spools, bobbins, and looms.
8. Signs and displays.
9. Sporting and athletic goods.
10. Woodenware and novelties.

Summary

Evaluation of the property data and general observations shows that second-growth Port Orford white-cedar has many potential uses. The differences between the old-growth and second-growth wood are not pronounced enough to judge either type superior. Any of the present

TABLE 3.—ANALYSIS OF POSITION IN TREE USING SPECIFIC GRAVITY AS INDEX OF COMPARISON

Position		Average gravity[1] specific	Conclusions resulting from statistical significance test
Quadrant	Southeast	0.387	No difference
	Northwest	0.387	
Radial position	1	0.400	Significant difference found between two positions
	2	0.381	
Longitudinal position (A.S.T.M. bolt designation)	*b*	0.406	Bolt *b* significantly higher than other four bolts. Bolt *r* significantly lower than other four bolts. Bolts *f*, *j*, and *n* are equal.
	f	0.379	
	j	0.377	
	n	0.361	
	r	0.345	

[1]Based on green volume and oven-dry weight.

[1]No comparisons, however, are made for certain properties involving a proportional limit value because of the personal element of error in determining that value.

uses for old-growth should be open, therefore, to second-growth wood, with the possible exception of battery separators. The evaluation of second-growth wood for this particular use is currently being carried out at a battery manufacturer's plant; preliminary reports indicate that there too the wood will be satisfactory.

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Coming Events

C.I.F. Annual Meeting

The Canadian Institute of Forestry will hold its annual meeting, with the theme of "The Forest Situation in Canada," October 19-21, in Winnipeg, Manitoba.

S.A.F. Annual Meeting

The Society of American Foresters will hold its annual meeting, with the theme of "Nature on Edge", September 14-17, in Colorado Springs.

American Forest Congress

The American Forest Congress of the American Forestry Association will meet in Washington, D. C., October 29, 30 and 31.

American Institute of Park Executives

The American Institute of Park Executives will meet September 13-18 in Denver, Colorado. Executive Secretary, Emile Mardfin, 30 N. LaSalle Street, Chicago 2, Illinois.

Western Forestry and Conservation Association

The Western Forestry and Conservation Association will hold its 44th forestry conference and annual meeting, Seattle, Washington, December 8-12.

Mid-Century Conference Resources for the Future

Resources for the Future, Inc., will hold its "Mid-Century Conference" in Washington, D. C., December 2-4.

New York S.A.F. Section Meeting

The summer meeting of the New York Section will be held in the eastern Adirondacks, September 10-11.

According to Fred E. Winch, Jr., Section chairman, the theme of the meeting will be the management of white pine.

History of Forests in the Quetico-Superior Country from Fossil Pollen Studies

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ALTHOUGH the facts of history do not always have immediate practical application, the records of history always add grandeur to a mighty and dynamic past, whether of mankind, the great age of mammoth reptiles, or, as in this instance, the advances and development of mighty forests. Fortunately, records involving organisms need not necessarily be massive remains, for they only too frequently are least adapted to good preservation.

Perhaps no parts of trees are better adapted to preservation in the fossil state than the midget reproductive structures, the pollen grains. These tiny grains are covered with two coats, known as *exine* and *intine*, constructed of a chemical substance known as *sporonine*, which is very resistant to decay. It is neither affected by such strong alkalies as KOH, nor by strong acids.

The pollens are very light; some have inflated appendages, or wings, which make them ideal for easy wind transport. In this manner they are whirled about and mixed thoroughly before they settle down. When they fall on bodies of water they sink and thus become part of the slowly accumulated sediments.

Von Post, the Swedish geologist, was the first investigator to recognize the possibility of using pollens as fossil evidence of forests and as valuable records of past forests, of their replacement in time, and of the climatic changes which favored forest succession. To a degree we can use pollens of various genera found in peat as representative of forest composition (Figs. 3-17).

Techniques

In the collecting of peat for pollen studies one must use care so that samples, especially from deep layers, be taken without contamination. The author uses the Hiller-type borer, a Swedish invention. This instrument can be under control of the operator at all times. Sampling is thus not dependent on springs or slot devices, which may or may not work, and which are especially inefficient in soft sediments where friction is greatly reduced. The author uses a borer 17 inches long and 1¾ inches wide. It permits taking three samples with each boring. Usually samples are taken at one-foot intervals, but in some cases more frequent sampling is desirable. Taking a number of samples with each boring saves much time, since the borer must be washed after each sampling.

The outer part of the core is cut off with a knife and enough peat to fill a four dm. vial is taken at each level. The vials are stoppered and marked plainly as to location of bog and foot-level of the sample. The author keeps the samples moist and adds no preservative. Samples have been kept in such condition for 15 years. In the laboratory the stoppers are sealed by dipping them in paraffin.

If the peat deflocculates readily, the Geisler (*3*) alcohol method yields good results with a minimum time requirement for preparation of slides. If peat is dry or deflocculates poorly the Erdtman (*1*) KOH method is used. A drop of 1 percent aqueous solution of gentian violet is an effective stain for pollens. Stained grains are counted with ease. An eyepiece micrometer and mechanical stage are essential equipment on a microscope used for analyses. Magnification of 350× is adequate for general tabulation work after one has become very familiar with pollen characteristics, but 640× is almost essential for critical examination of pollen details.

FIG. 1.—Sketch map showing location of the Quetico-Superior area on the International border.

The customary procedure is to count 150 or 200 pollen grains for each foot-level. If pollen is very sparse 100 or less grains may have to be used. This procedure had to be taken at the indicated foot-levels at the following bogs: Jeanette 7.5, Johnson Camp 11.5, Fenske 30 to 32, Back Bay 14, Hubachek 19, Dog River 15.75, Lac La Croix 13, and Washington Island 6.5. At all bogs samples were taken for one or two foot-levels in the underlying sand but when ten or more slides yielded only a few pollen grains the levels were not included in the graphs. Representation of pollens of a given genus is expressed in terms of percentage of the total number of grains counted at a given foot-level (Figs. 3-17).

For this study the aim in the field was to bore two bogs in the same general neighborhood and to distribute collections at rather frequent intervals near the southern border of the Quetico-Superior National Forest in Minnesota, to take some samples within the roadless area of the forest, and some along the northern border of the Quetico Provincial Park in Ontario (Figs. 1 and 2).

This general area is now being proposed as the Quetico Superior International Peace Memorial Forest.

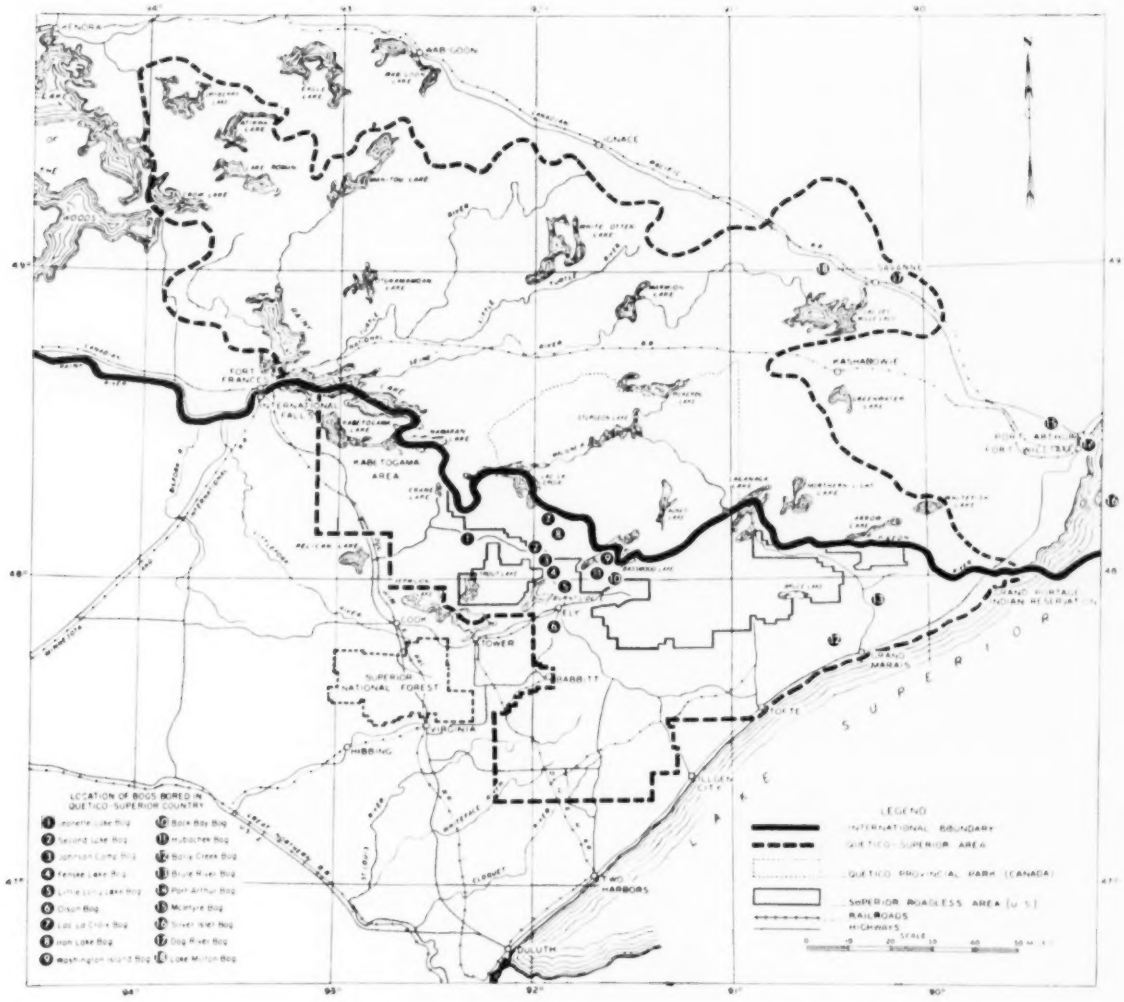


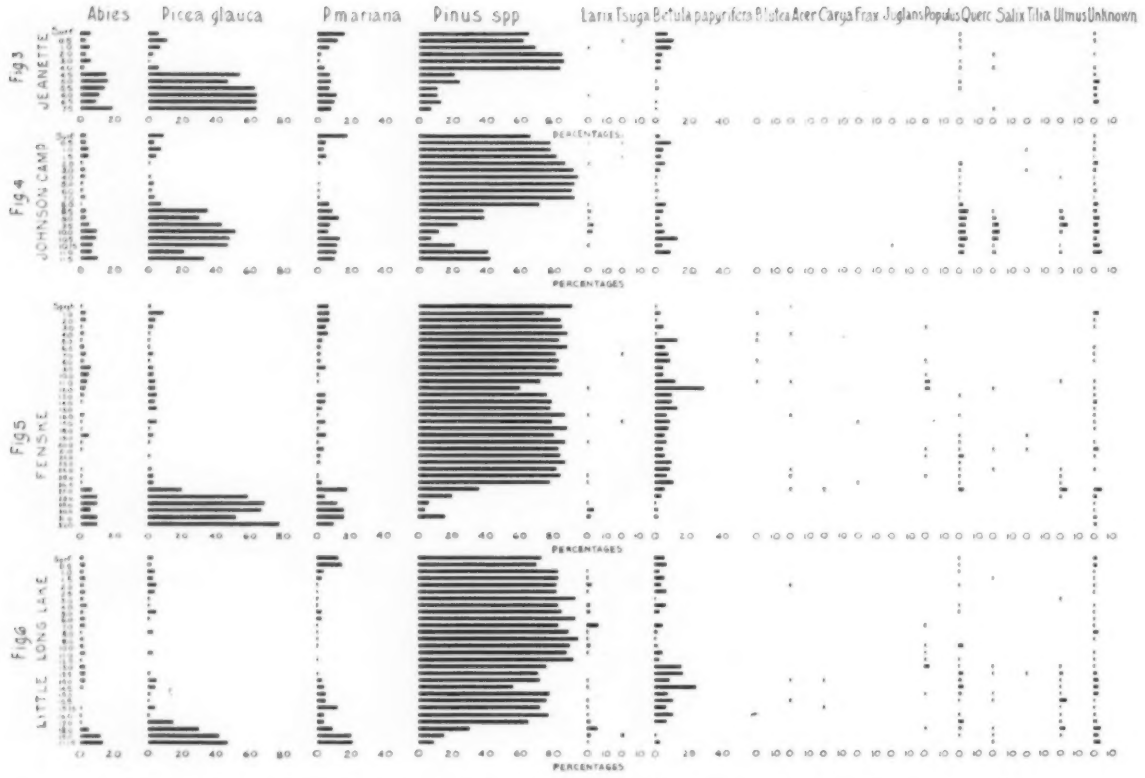
Fig. 2.—Map showing location of bogs studied in the Quetico-Superior country.

Results

The history of the forest is rather simple in detail; succession was chiefly between genera of conifers (Figs. 3-17). All 15 bogs studied show spruce-fir or spruce-fir-pine as initial forest cover. In all locations the pioneer association was followed by a long period characterized by almost complete dominance of pine. In a few foot-levels at eight bogs the pine was interrupted by high peaks of dominance by birch. The occurrence of the birch peaks is so erratic that climatic control can hardly be read into them. Whereas 9 of the 15 bogs closed with a rather prominent pine-spruce-fir forest, this characteristic is most pronounced as one proceeds northward (Figs. 15-17). The mildly expressed or, again, prominent intrusion of spruce and fir at topmost levels suggests a cooling climate in more recent times.

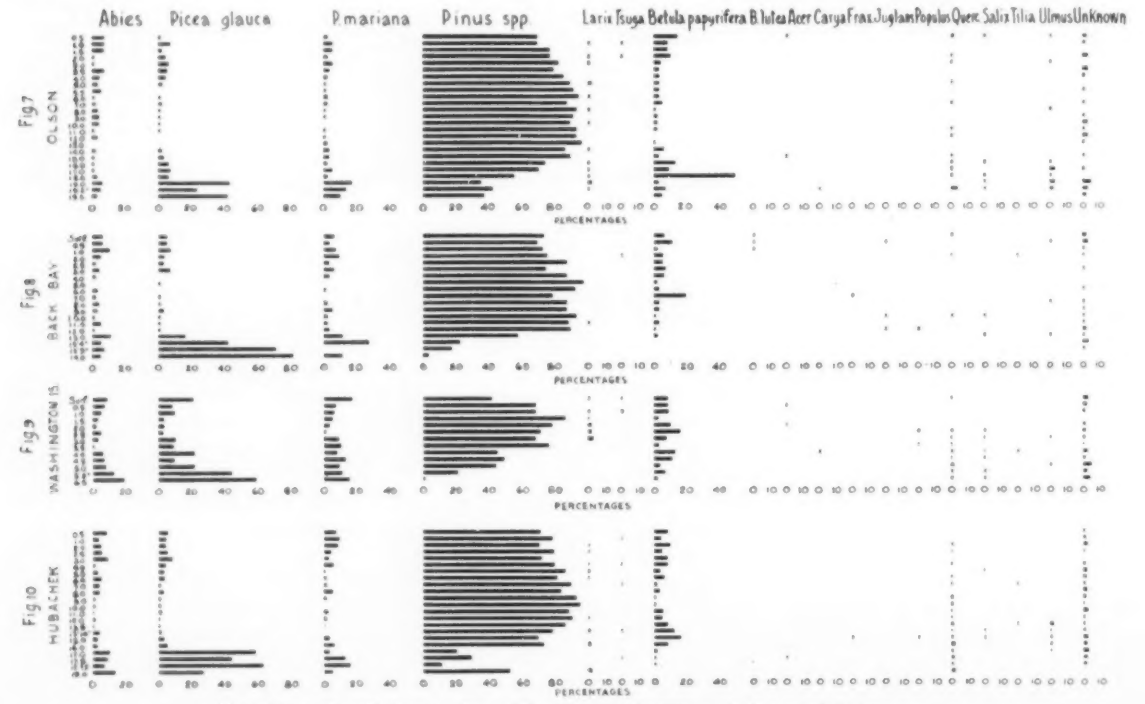
The very minor broadleaved genera element composed of Quercus, Ulmus, Tilia, Carya, Juglans, and the mesophytic conifer Tsuga had its best, though poor, representation at about mid-profiles. This, too, adds support to the hypothesis of a deteriorating climate. Likewise, at the Ontario stations (Figs. 15-17) the pine and black spruce forests succeeded a prominent pine period during which oak and elm also had a sparse representation and spruce and fir had almost disappeared. The very low spruce and fir representation in the forest cover during mid-profile is characteristic for all bogs, and so the contributing cause was a regional phenomenon.

Pine pollens were recorded in two groups characterized by difference in size, of which jack pine (*Pinus banksiana*) has the smallest grains. Because of a two-way overlap in size frequency it was deemed wise to record all under pine. There is little doubt, however, that



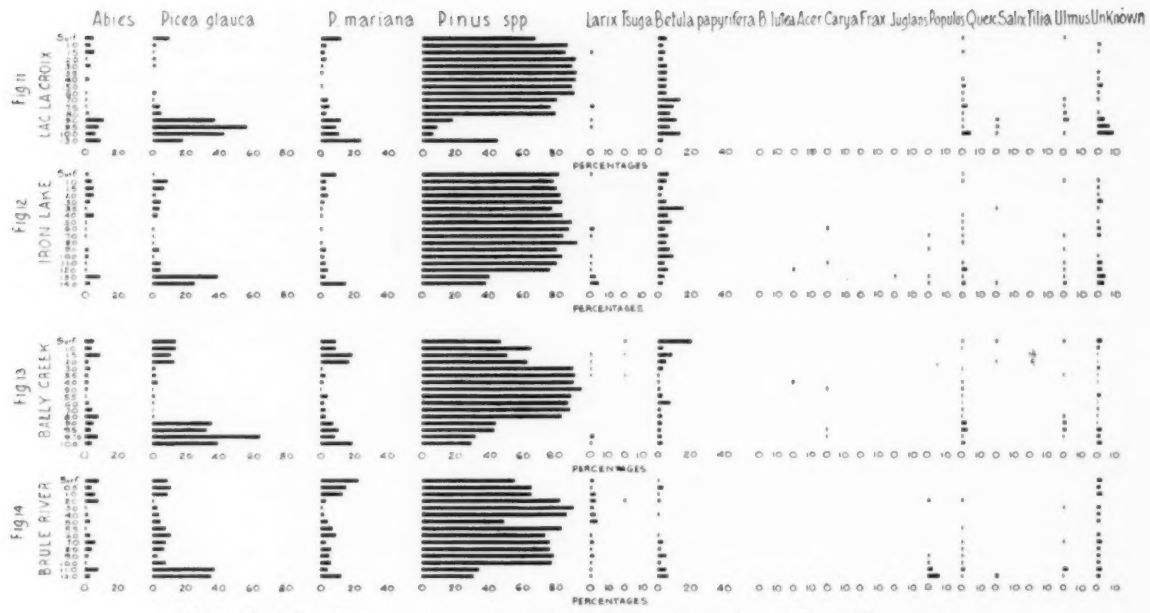
FIGS. 3 TO 6.—Pollen profiles from four bogs along the southern border of the Quetico Superior region.

FIG. 3.—Jeanette Bog. This is location No. 1 on the map.
FIG. 4.—Johnson Camp Bog—location No. 3 on the map.
FIG. 5.—Fenske Bog—location No. 4 on the map.
FIG. 6.—Little Long Lake Bog—location No. 5 on the map.



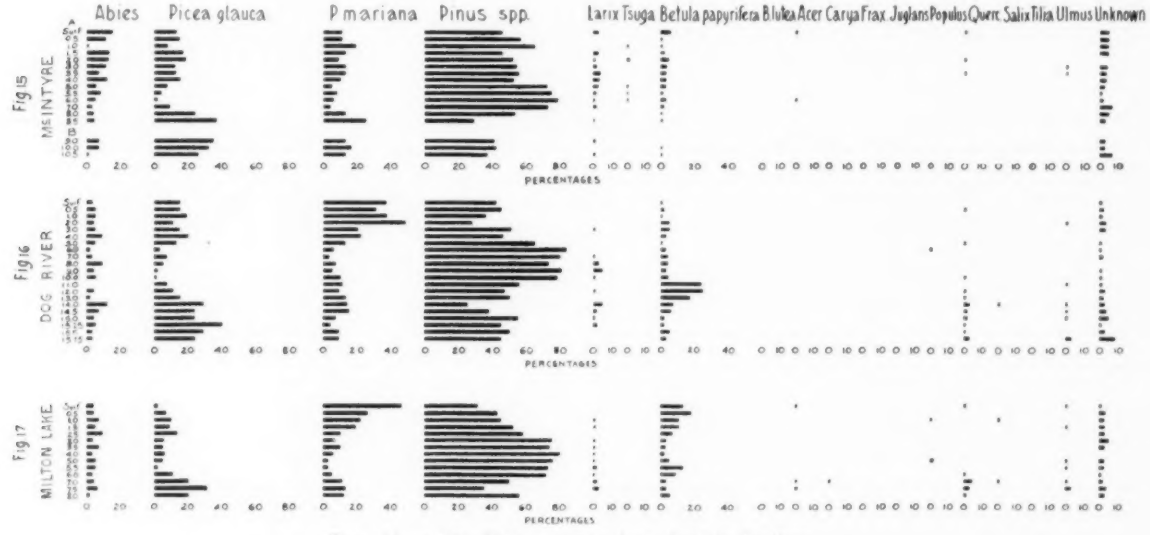
FIGS. 7 TO 10.—Pollen profiles of bogs from the Ely and Basswood Lake area.

FIG. 7.—Olson Bob. This is location No. 6 on the map.
FIG. 8.—Back Bay Bog—location No. 10 on the map.
Fig. 9.—Washington Island Bog—location No. 9 on the map.
FIG. 10.—Hubachek Bog—location No. 11 on the map.



FIGS. 11 TO 14.—Pollen profiles of bogs from the Lac La Croix and Brule River Area.

FIG. 11.—Lac La Croix Bog. This is location No. 7 on the map.
FIG. 12.—Iron Lake Bog—location No. 8 on the map.
FIG. 13.—Bally Creek Bog—location No. 12 on the map.
FIG. 14.—Brule River Bog—location No. 13 on the map.



FIGS. 15 TO 17.—Pollen profiles from Ontario Stations.

FIG. 15.—McIntyre Bog. This is location No. 15 on the map.
FIG. 16.—Dog River Bog—location No. 17 on the map.
FIG. 17.—Milton Lake Bog—location No. 18 on the map.

the initial pine, associated with spruce and fir in lowest levels, as well as at the beginning of the prominent pine peak, was *Pinus banksiana*, for pollen grains are all very small. This condition (Fig. 19) also applies to the closing foot-levels at the Ontario stations where black spruce and jack pine are the characteristic forest trees at present. There is no doubt that a succession from jack pine to white-red pine occurred at all 15 locations, and so must have been a regional feature. Only at the Ontario stations does jack pine replace the white-red pine complex, which, again, suggests a cooling climate in the recent past.

Five major or minor successions, and perhaps the same number of changes in climate, stand out prominently. They are: (1) spruce-fir, or spruce-fir-pine; (2) pine-spruce-fir transition; (3) jack pine; (4) white-red pine (minor broadleaved element and relic status of spruce and fir); and (5) pine-black spruce (decline of broadleaved genera).

Discussion

Pollen analysis is no longer in its infancy in North America. A

quarter-century of persistent but sporadic investigation has definitely established regional tendencies in forest succession, with indicated climatic changes and glacial retreat. Hence pollen analysis is now a vital indicator of glacial times and determines whether sediments will be included in carbon dating. We know that spruce and fir had migrated far south of the glacial border as Potzger and Tharp (*8*) showed for Texas, and Frey (*2*) for North Carolina. We also know that some regions had a rather simple forest history, as typified by the Quetico-Superior area (*9*). Others had a very complex forest history as shown by Potzger (*7*) for Indiana, and especially for lower Quebec (*10*). We know that pine was not very important in the Tazewell substage regions of Indiana (*7*), but appears to have become increasingly more important in the forest complex northward from central Indiana. This was shown specifically by Potzger (*7*) in a line transect from central Indiana to northern Michigan, Wisconsin, and Minnesota.

The postglacial history of the Quetico-Superior forest closely resembles that of sandy areas in Upper Michigan and Wisconsin (*7, 9*), and the mid-profiles of Quebec (*10*). The great pine period had quite generally declined in Quebec, as it also had declined on better loam and clay soils in Michigan and Wisconsin (*6*) as upper foot-levels of peat were being deposited. In Michigan and Wisconsin it was replaced by hemlock, maple, beech, and yellow birch, whereas in Quebec it was chiefly yellow-birch. There is, thus, every indication as expressed by Potzger (*7*) that pine is no longer a climatic climax in most of the lakes region but that it represents an edaphic or microclimatic climax determined by sandy soil.

The Quetico-Superior forest is apparently still a climatic zone which favors pine. Along its northern border it may perhaps be an ecotone between spruce-fir and pine (specifically jack pine) climaxes.

The rather short initial spruce-fir period is quite characteristic

FIG. 18.—View of the Johnson Camp Bog—typical of the bogs bored in the Quetico Superior region. A carbon dating was obtained from the 8 foot level of this bog.

along Mankato borders, and the consistent intrusions by broad-leaved genera may coincide with the xerothermic period postulated by Sears (*11*), for oak expressed itself in a prominent minor peak in profiles from bogs a comparatively short distance to the south of the Quetico-Superior Forest in Hubbard County, Minnesota (*7*).

The striking characteristics of the 15 profiles are the close resemblance of major waves of succession (Figs. 3-17). Since the geographical extent is considerable, there remains little doubt that this succession was the result of climatic changes. It is, of course, difficult to define the climatic conditions which found expression in pine forests, but temperature may have been one or "the" major factor as it is apparently today in northward extension of pine forests. The definite greater importance of the boreal elements in the Ontario locations, and more accentuated bimodal peaks of spruce and fir, certainly justify the assumption of an ecotone condition somewhere in the central part to northern border of the Quetico-Superior forest, where boreal species, especially black spruce, have a more favorable position than in the upper Minnesota forests, approximately 85 miles to the south (Figs. 3-17).

On the other hand, it is somewhat difficult to account for the stronger pine element (presumably jack pine) in the earliest pioneer forests at the Ontario stations (Figs. 15-17) than at the southern Minnesota locations (Figs. 3-14), where only Johnson Camp, Hubachek, Lac La Croix, Iron Lake, and Olson bogs approach the percentage of pine of those in the Ontario locations. No doubt microclimatic factors made variations in forest types then as now, with differences in soil and amount of protection which gave the more sensitive pine an advantage.

The author has never felt justified to consider paper birch a strong climatic indicator. In the Great Lakes region (except on Isle Royale) and southward to Indiana, Betula never appears very prominently, except occasionally in an isolated foot-level, as at Fenske, Bally Creek, and Olson bogs. Even when it is abundantly represented in an entire profile the erratic peaks always remind one of Halliday and Brown's (*4*) description of it in the Canadian forests of the present, i.e. a tree favored by forest disturbances.

One is always impressed with the definiteness that pollen profiles show at least the major climatic and vegetational changes in bold outlines, as for instance the mid-profile decline of spruce, which appears in all 15 bogs of the present study. This fact stamps it as a regional phenomenon and so a climatic factor. The close of the spruce-fir period and initiation of the pine dominance is, of course, placed definitely in time for the Quetico-Superior forest area by the carbon dating of peat from the 8-foot level of the Johnson Camp Bog (Figs. 4-18). In view of the regional uniformity of the profiles, the age must be representative for the pine period of the region. It is recorded by Libby (*5*) as 7,128, plus or minus 300 years.

As the work of carbon dating

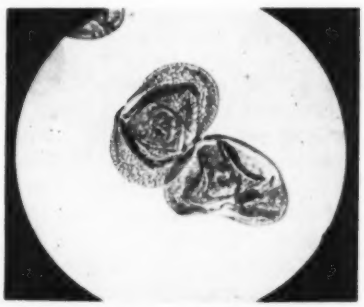


FIG. 19.—Pollen of black spruce—enlargement from photomicrograph taken at 360× magnification.

progresses we will gradually get a clearer picture of the changes projected against definite time. The pollen profiles indicate vividly the many generations of great pine forests which have uninterruptedly occupied the region, and only in the more recent past declined somewhat as spruce and fir increased.

Summary and Conclusions

1. The paper presents 15 profiles from bogs of the Quetico-Superior region in Minnesota and Ontario.

2. Major waves of forest successions are spruce-fir to pine, with a secondary pulse at mid-profiles where spruce and fir declined to negligible representation and broadleaved genera (Ulmus, Quercus, Carya, Juglans, and Tilia) had their best representation; and a decline of pine, compensated by increase of spruce (especially black spruce) and fir at topmost foot-levels.

3. The more northern Ontario stations show a stronger representation by boreal spruce and fir than the Minnesota bogs.

4. The Ontario bogs close with a prominent black spruce-pine forest (to all appearances jack pine) which much suggests the forest conditions there at present.

5. Birch shows abundance only at a few isolated foot-levels, which probably means disturbances in the forest rather than climatic fluctuations.

6. Initiation of the long pine period following the rather sudden decline of spruce-fir has been carbon dated at the 8-foot level of the Johnson Camp Bog (Fig. 4). The age is given as 7,128, plus or minus 300 years.

Acknowledgment

Extensive field work and preparation of illustrations is not easily done without the cooperation of various individuals and agencies. We are indebted to the following: Mrs. Margaret Esther Potzger for the graphs; Ralph P. Wentworth, consultant to the President's Quetico-Superior Committee, for the suggestion that the study be undertaken and for all initial arrangements with the U. S. Forest Service for headquarters and transportation into the roadless area; Charles E. Scheffe for efficient help and transportation of heavy equipment; the U. S. and Canadian Forest Services for extensive help such as aerial maps, personal direction, cabins, and plane service; Dr. Edward S. Deevey, Jr., of Yale University who recommended that Drs. W. F. Libby and J. R. Arnold of the Institute for Nuclear Studies, Chicago University, make the carbon dating of peat from the 8 foot level of the Johnson Camp Bog; Sigurd Olson for valuable in field studies; and C. E. Ahlgren for launch service and locating bogs in the Basswood Lake area. F. B. Hubachek was a most inspiring and generous host while the work in the Basswood Lake area was in progress.

This is contribution 271 of the Butler University Botanical Laboratory. The field work was supported by research grant 1152 from the American Philosophical Society. Sincere thanks is expressed for this aid.

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Chemi-Peeling Pulpwood in New York

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Peeling the bark off pulpwood in preparation for its use in paper making in an old endeavor in which the industry has recently taken a renewed interest and in which foresters are currently making substantial progress.

HALF A CENTURY ago, almost all pulpwood was sap-peeled in the forest. What little bark was missed got knocked off in the river drive, so that all the pulp mill needed to produce bark-free wood was a washing drum. The scarcity and high price of woods labor during and since World War II reduced the amount of sap-peeled wood produced and compelled many mills to fill out their requirements with rough pulpwood. The acceptance of unpeeled wood presented a whole series of new problems, both technical and economic. One approach was to install bark-removing machinery at the wood yard. This involved both high capital and considerable maintenance costs and presented a new problem in bark disposal. Ideally, only clean, peeled wood should ever reach the mill, the bark being left behind at some point where its disposal is cheaper than at the point of use.

Peeled wood has many advantages and they accrue all the way from the stump to the paper machine. When pulpwood is debarked in the forest, the commercially worthless bark is left where it grew, to go back into the soil. Since bark makes up about 10 percent of the weight of rough wood, peeling can make a substantial reduction in both skidding and trucking costs. Then too, peeled wood loses considerable moisture after bucking, with added savings on transportation. At the roadside and in storage at the mill peeled wood is less vulnerable to fungi and insects. When rough wood is fed directly to the chipper, the bark must be digested and then washed from the pulp—a waste of chemicals and an added pollution hazard.

Sap-peeling, the time-honored method, requires a lot of hard labor during a relatively short period in late spring and early summer. It works well on the conifers and on aspen and soft maple, fair on cherry and the birches but poorly on hard maple and beech. It has the added disadvantages of being strongly influenced by the weather, both as to duration and working conditions; of coming at the peak of farm labor requirements; and of coinciding with the season when heat and insects make woods work something less than enjoyable.

Portable mechanical peelers of the drum, chain and floating-cutterhead types have been developed. Most present designs handle short and small wood and are best suited to peeling at the landing. The chain machines work well only on fresh, spring-cut wood; the hand-fed types are man-killers to boot, especially on knotty bolts. Cutterheads are wasteful of fiber and not too good on irregular or knotty sticks.

Chemi-Peeling Standing Timber

The use of chemicals to facilitate the removal of bark from standing timber offers a fresh and economically sound approach to this tough problem. Their employment simply to kill trees is nothing new. As long ago as 1931, Cope and Spaeth (*5*) perfected both a technique and a tool for injecting sodium arsenite with the object of deadening hardwood trees. No one then appreciated its possibilities for making peeled pulpwood, chiefly because aspen, a good sap-peeler, was the only hardwood for which there was an established market.

It was not until 1942 that a procedure for debarking trees by the aid of chemicals was developed in Canada and patented by A. R. White. McIntosh and Hale (*8*) have reported the subsequent research work that was carried out by the Canadian Forest Products Laboratory and Marathon Paper Mills of Canada, Ltd. But not until the Armstrong Forest Company of Johnsonburg, Pennsylvania, became interested in chemi-peeling was a commercial technique perfected for debarking both hardwoods and softwoods on a large scale. They have not only made their research findings and experience available to the forestry profession but have also bought out White's U. S. Patent No. 2,324,968. Great credit is due to President E. O. Ehrhart of Armstrong Forest Company for dedicating these patent rights to public use and to A. L. Bennett, their woodlands operation manager, for his work in developing and testing the Armstrong technique (*1*).

In New York a few chemi-peeling tests were initiated in the spring of 1950, many more in 1951 and 1952. The authors have done a considerable amount of this work themselves and have observed much done by others. Of necessity, our findings are empirical. They are in no way comparable with the detailed and fundamental research being carried on by the chemical debarking project at the State University of New York College of Forestry at Syracuse. We feel that it can be practiced on an extensive scale wherever a market for peeled pulpwood exists. It also has an application in the production of round, peeled fenceposts destined to receive treatment with oil-soluble preservatives.

Advantages

Chemi-peeling has several conspicuous advantages. It permits the treatment of enough trees during a relatively short spring season to insure year-round production of peeled wood, once a backlog of treated material has been developed. Potential farmer producers,

who cannot take time from spring work to cut and sap-peel pulpwood, can now treat quickly with chemicals, postponing the big labor items until slacker times. Chemi-peeling is much cleaner, faster and less laborious than sap-peeling. Reduced resin flow makes coniferous bolts much nicer to handle. As the trees stand dead, some of the conifers lose a good deal of moisture, with weight decreases up to 19 percent four months after treament (*7*).

Disadvantages

The disadvantages of chemi-peeling are few. The chief snag is the time lag between treatment and easy peeling. With most deciduous species, trees treated one year are best left standing until the following spring; the contract between producer and consumer will have to cover that span. The other is the toxicity of the chemical. Sodium arsenite is the only compound which has given good, quick and consistent results in a wide range of species. In search of a less toxic compound, the junior author has tested chromated zinc chloride, ammonium sulphamate, copper sulphate, 245-T, creosote, pentachlorophenol and Dow Defoliant. None gave results comparable with sodium arsenite. Since proper precautions by the handlers can eliminate much of the hazard, this is not an insuperable disadvantage.

Equipment and Materials

The equipment and materials for chemi-peeling are few and easily acquired. A light single-bitted axe or, on small or thin-barked trees, a Scout hatchet; a light 12-16 inch spud; a 4-quart pail with a bail and a 2- or 3-inch paint brush with synthetic bristles are all that are needed. A doughnut-shaped disc of plywood floated in the pail will reduce slopping. The man doing the painting will do well to protect hands and arms from contact with the solution either by wearing rubber gloves or by applying a skin protector such as Pro-tek, a DuPont product. The Cornell Tree Killing Tool developed by Cope and Spaeth (*5*) has also been found useful in treating small trees. This tool makes an incision through the bark and applies the solution, all in one operation, low on the stem and without the operator having to bend over. On trees over 10 inches or on thick-barked smaller trees, the tool is not efficient.

Sodium arsenite is commercially available in either powder or liquid. Although the powder is cheaper, the hazard and difficulty of dissolving it more than offsets the lower cost. Concentrated solutions are sold under such trade names as Atlas "A" Debarking Compound (Chipman Chemical Company) and Penite 6 (Pennsylvania Salt Mfg. Co.). For safety, all containers should be plainly labeled and the workers trained in emergency treatment. Strong solutions (approximating 3 pounds per gallon) should be used until more complete testing proves otherwise. Weak ones (1 pound per gallon) have worked well on some species but the response is slow. As liquid arsenite is now priced at 65c to $1.50 per gallon f.o.b. warehouse and a gallon will treat 15 to 25 cords, its cost is not important. We have seen no indications that solutions stronger than 3 pounds do a better or quicker job.

The Operation

Basically, the chemi-peeling operation is quite simple. In the late spring and early summer—June to early August in New York—when the trees are growing rapidly and peeling is easy, a girdle of bark 4 to 6 inches wide is removed from the trunk, as low down as feasible. Where possible it is best to bump the bark off with the back of the axe. When the edge is used, care must be exercised not to cut into the wood. On trees with a cross-fibered bark, like the birches, one or two axe-strokes lengthwise will permit a girdle to be easily spudded off. It is essential that the bark be completely removed all the way around. The freshly exposed wood is then thoroughly painted with arsenite solution, care being taken to soak the upper edge. The solution is absorbed so quickly that the girdle is dry within an hour or two. The day's work should not start until about 9:00 A.M., by which hour growth is proceding rapidly (*6*).

It is perfectly possible for one man to do chemi-peeling. However, the need for gloves or other protective covering makes a separation of jobs between girdling and painting much more efficient. One painter can keep up with from five to eight axemen.

During the season of active growth the outer layers of wood carry most of the water supply upward to the leaves (*2*). The arsenite passes into this water column and is quickly translocated upward, killing the cambium. If a too-heavy clip with the axe nicks the wood, no arsenite will be drawn up and a "green streak" of untreated wood will remain alive, to which the bark will stick. On hardwoods, a strong solution put on early will show results within a month; with a weak one, "autumn will come early" but there will be no conspicuous withering of foliage. Conifers respond quickly, usually within two weeks. Chemi-peeling will kill the tree above the girdle but translocation downward at this season is slight and the bark below the girdle will remain alive. Sprouting is reduced but not entirely prevented. In our experience, beech root-suckers have not been adversely effected, although this response may depend on the origin and vigor of the stand. Generally, the larger and more dominant the tree, the better the response to arsenite.

The longer the tree is left after treatment, the less the labor required to get the bark off, but obviously it should be harvested before insect or fungus damage occurs. Some species become operable soon after treatment. After four months and lasting until freeze-up, all conifers tested by us and also a few of the hardwoods peeled even more easily than in the sap season. Most hardwoods require a winter's freezing and thawing before the bark loosens. By springtime all species tested, except white ash,

peeled well; by midsummer the bark was thoroughly loose and actually falling off some species, leaving the stem bare. Only with the birches did the loosened bark hang together persistently. In the case of some thin-barked conifers, we have found that the moisture content of the bark effected the ease of peeling. Dry bark came off in flakes rather than in strips. Peeling was good in November and again in the spring, but it was poor in June and July and dry sticks had to be soaked before the bark could be gotten off.

Response to Chemi-Peeling

The exact pattern of response to chemi-peeling varies with species:

Red pine.—Needles turn a bright, foxy red in 7-14 days. Bark peels well by October, comes off beautifully the next spring. As the Pine Sawyer (*Monochamus*) will attack trees that still have bark on, all merchantable material must be peeled before July 1.

White pine.— Responds like red pine but appears to be even more susceptible to insects and to blue stain, if peeling is postponed too long.

FIG. 1.—Chemi peeled beech tree a year after treatment, with heap of fallen bark and a frill of sprouts from the lower edge of the girdle.

Norway spruce.—Foliage dies within 2-3 weeks. In November bark comes off easier than during sap-peeling. Numerous branches interrupt the long slabs which would come off pruned trees. From suppressed trees, bark comes off in chips.

Balsam fir.—Our experience is limited to a few trees on which results were excellent. This agrees with Canadian findings.

White cedar.—By autumn whole sheaths of bark can be pulled off by hand. This offers an easy way to peel posts, poles and cabin logs.

Aspen.—The leaves blacken shortly after treatment. By late fall treated popple peels better than in spring. Even better results are obtained after winter weathering has loosened the bark. There is pronounced surface discoloration of the wood.

Ironwood.—Responds well. Eleven months after treatment the junior author's 3-year old son pulled twenty-foot strips off standing trees; only the angle of pulling prevented the removal of even longer pieces.

Birch.—We have observed results on yellow, paper grey and black birch. It takes a strong, thorough treatment to kill any of these and many trees leaf out the next season. The transverse fibers prevent the bark from breaking up, but after the tree is felled, the sheath can be split with an axe and will then slip off.

Beech.—This is the $64 discovery. Beech girdles very well by bumping. Within a year most of the bark will have fallen and the rest will be so loose that it will come off at the slightest disturbance. Ingrown seams will cause trouble if not carefully worked to insure a complete girdle. Because of the tremendous quantities of beech unsuited to any more exacting use than pulpwood and the extreme difficulty of sap-peeling it, the excellent response to chemi-peeling is most important.

Elm.—This species debarks especially well the first autumn when large sheaths can be pulled off by hand.

Black cherry.—This is among the

first to show blackening of the foliage. Bark separates well, in sheaths, but seldom fails.

Hard Maple.—Does not top-kill as readily as most species, yet peels well and promptly. On June 28, 1952, the senior author treated a wolfy, 24-inch dominant. Two months later, the bark was easily and cleanly peeled from the lower trunk yet the crown was apparently uneffected. In hard maple, "green streak" seems to be especially troublesome.

Red maple.—Treats well with this same "green streak" problem. After a year, most of the bark will have fallen off.

Basswood.—Responds best to early-season treatment, a year after which the ribbed bark comes off in long strips.

White ash.—This is the only species investigated that does not respond to chemi-peeling; in fact, the bark seems to stick even tighter after treatment.

After a treated tree has died and the bark loosened, the wood develops a smooth, hard surface. The limbs, by then quite brittle, tend to break off when the tree is felled but leave stubs that take careful work to chop off neatly. Among broad-leaved species, the wood remains quite wet. McIntosh (7) reports no weight reduction, at least up to 14 months, in the species with which he worked. But it appears that softwoods will dry out considerably. Perhaps the best operational procedure will be to skid and buck the wood and pile it in widely spaced ranks in the open for a couple of months before trucking. There is some indication that chemi-peeled red pine develops fewer and smaller checks than does sap-peeled wood, which often opens up a single split going in to the center. This finer checking should make for a better looking and stronger treated post.

Costs

So far, cost data for New York are too fragmentary to permit fair appraisal. One pulpwood buyer has offered to finance producers who would do chemi-peeling by supplying the arsenite and paying 75c per cord for the labor; both operator and purchaser consider the deal equitable. District Forester J. D. Kennedy has successfully treated two sizable stands running heavily to overmature beech, at costs for girdling and arseniting of $1.11 and $1.60 a cord. Plantation red pine require 1½ to 3 minutes per tree when the stems run 4-6 inches. Many more woodlot and large-scale operations are needed before satisfactory cost figures can be assembled but it seems certain that they will be substantially lower than the price now paid for sap-peeling.

The senior author (*3, 4*) has previously pointed out the potential danger of arsenite to wildlife. We believe that the Armstrong technique, when properly used, is much less hazardous than other methods and that the risk to mammals, birds and fish will be but little.

Summary

Chemi-peeling has startling possibilities for the reduction of cost and the improvement of product in pulpwood production. It can be applied to a large volume of timber in a relatively short time. The loosened bark will remain at the stump where it can go back into the soil and not become a problem in the mill yard. For a nominal sum—perhaps $1.50 a cord—considerable inventories of peeled wood can be stored on the stump, to be cut and delivered as required. It will permit the transportation of drier and hence lighter wood. At the landing and in the mill yard, there will be less hazard from decay and insects. It is to be fervently hoped that some of these savings will accrue to the benefit of the forest landowner and that he, in turn, will put some of them back into growing better timber.

As a tool for forest management, chemi-peeling shows much promise.

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FIG. 2.—Ironwood 11 months after treatment, with bark stripped up 20 feet.

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The Effect of Fertilization and Injury on the Cone and Seed Production of Loblolly Pine Seed Trees[1]

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The frequent shortages of loblolly pine seed for natural regeneration prompted investigation of ways to stimulate seed production of seed trees. Partial girdling failed because, as applied, it was too mild an injury. Fertilization was not effective with 40-year-old trees, but significantly increased the cone crop of 25-year-old trees. As explained in summary, the amount of fertilizer may have been inadequate for the 40-year-old trees.

LARGE AMOUNTS of seed are needed to assure success in regenerating loblolly pine stands under even-aged management. Insects, birds, rodents, poor seedbed conditions, and possibly other factors, may inflict large losses. Many stands of pole size are now being harvested, however, because of the heavy demand for pulpwood, and the remaining seed trees are often too young to produce enough seed, especially in poor seed years.

The success enjoyed by agriculturists in increasing the yields of field, forage, and orchard crops has suggested fertilization as one way to increase the seed production of young loblolly pine seed trees. Although fertilization of forest trees has not been studied extensively, the few cases on record indicate that it can substantially increase seed production. Gemmer (*5*) recorded the cone production of longleaf pine trees that had been treated with pine-needle mulch, sodium nitrate with and without irrigation, irrigation alone, and a complete fertilizer with irrigation. Soil treatment for 5 years resulted in 7 to 30 times as many cones as on untreated trees. The complete fertilizer plus irrigation produced the greatest response, 62 cones per tree compared with 2 cones per untreated tree. Chandler (*2*) fertilized sugar maple and beech trees in a second-growth stand with varying amounts of nitrogenous fertilizer. He expressed the response to fertilization by the seeding index, which was the percentage of trees bearing seed multiplied by the average percentage of the crown surface that bore seed. In beech the seeding index of fertilized trees was 133 to 647 percent of that of the check trees. In maple the difference amounted to 3,040 percent of the seeding index of check trees. Detwiler (*4*) reported an oak shade tree that had produced 1 to 2 bushels of acorns in good seed years before fertilization and 8 to 10 bushels after an accidental, heavy fertilization.

Girdling and banding have also been used on an experimental scale to increase fruiting. Pond (*6*) girdled black ash trees by removing a ½-inch band of bark spiralled three times around the stem, by a ½-inch complete girdle, and by a complete knife-cut girdle. The first two treatments killed all trees, but the knife-cut stimulated 50 percent to produce seed compared with 10 percent of the check trees that were fruitful. Arnborg (*1*) partially girdled pines by making two semi-circular overlapping cuts. Treated trees produced 0.73 liters and check trees 0.35 liters of cones. Similar responses have followed banding.

In view of these results, a study was undertaken in southeastern Virginia in 1948 to determine the effects of fertilization and injury on the cone and seed production of loblolly pine.

Procedure

Two seed-tree cuttings made in the winter of 1947-48 were chosen for the study. One stand was 25 years old at the time of cutting and the other was 40 years old. The soil was the same type and series, Norfolk loamy sand to sandy loam, at both locations and the site index was 80 feet.

Each of the following treatments was applied to 25 well-formed, sound, uninjured trees at each location in April 1948:

1. No treatment.
2. Knife-cut through the bark to the wood halfway around the stem 3 feet from the ground.
3. Twenty-five pounds of complete fertilizer (7-7-7) spread around the tree to 2 feet beyond the edge of the crown.
4. Fifty pounds of complete fertilizer applied as in treatment (*3*).

The trees selected averaged 12.6 inches d.b.h. in the younger stand and 14.7 inches in the older stand.

The rate of fertilizer application was based on the minimum amount per tree required to produce responses in nut trees (*3*) and on the amounts applied in Chandler's (*2*) study. Twenty-five pounds of 7-7-7 fertilizer contains 1.75 pounds each of total nitrogen, phosphate and potash.

Cones were counted with binoculars every fall from 1948 to 1951. In 1948 only sound cones were counted but in the last three years defective cones also were counted and were recorded separately. In 1950 two sound cones were taken from each study tree, the seeds were extracted and cut, and the numbers of sound and defective seeds were recorded.

Effect of Injury and Fertilization

The total numbers of cones per tree produced under each treatment in 1950 and 1951 are shown for both locations in Table 1. Treatment effects are reflected with greater accuracy by the total number of cones per tree than by the number sound, because cone losses are independent of flowering. Since treatments could not affect

[1]This study was planned and installed on lands of the Camp Manufacturing Company, Inc., by K. B. Pomeroy and I. H. Sims, silviculturist and research center leader, respectively, of the North Coastal Plain Research Center, Franklin, Va., at the time the study was started.

TABLE 1.—AVERAGE NUMBER OF CONES PER TREE ACCORDING TO AGE, NUMBER OF GROWING SEASONS AFTER TREATMENT, AND TREATMENT

Treatment	Cone yield of 25-year old trees		Cone yield of 40 year old trees	
	3 years after treatment	4 years after treatment	3 years after treatment	4 years after treatment
	Number	*Number*	*Number*	*Number*
None	36	149	191	213
½ girdle	27	100	191	305
25 lbs. fertilizer	98	176	201	265
50 lbs. fertilizer	123	157	254	334
Average all trees	71	146	209	279

cone production in less than three growing seasons, the production before 1950 is not shown. Loblolly pine cones require two growing seasons to mature, and flower buds must first be formed.

The knife-cut injury failed to cause an increase in cone crop in both stands, apparently because the injury healed over before bud formation. Treatments were applied late in April and by the end of June all knife cuts had healed. A small-scale test of full knife-cut girdling and of partial girdling by removing a ¼-inch strip halfway around the stem had been initiated in a partially-cut stand in 1947. The ¼-inch strip did not heal during the following season and that treatment caused a significant increase in the 1948 cone crop—53 cones per tree compared to 15 per check tree.

Both lightly and heavily fertilized 25-year-old trees produced significantly more cones than the check trees in the first effective year, but the production of the heavily fertilized trees was not significantly greater than that of the lightly fertilized trees. Apparently most of the additional 25 pounds of fertilizer was superfluous.

In the next year all of the 25-year-old trees produced more cones but the effect of fertilization had disappeared. The response to fertilization only in the earliest possible year suggests that its effect was directly nutritional rather than indirectly through the development of more foliage and an increase in reserve carbohydrates, as seems to be true with deciduous species (2). If a greater concentration of reserve carbohydrates following the development of more abundant and efficient foliage had caused the increased cone production, it seems likely that a response would also have been evident in the second effective year since the larger

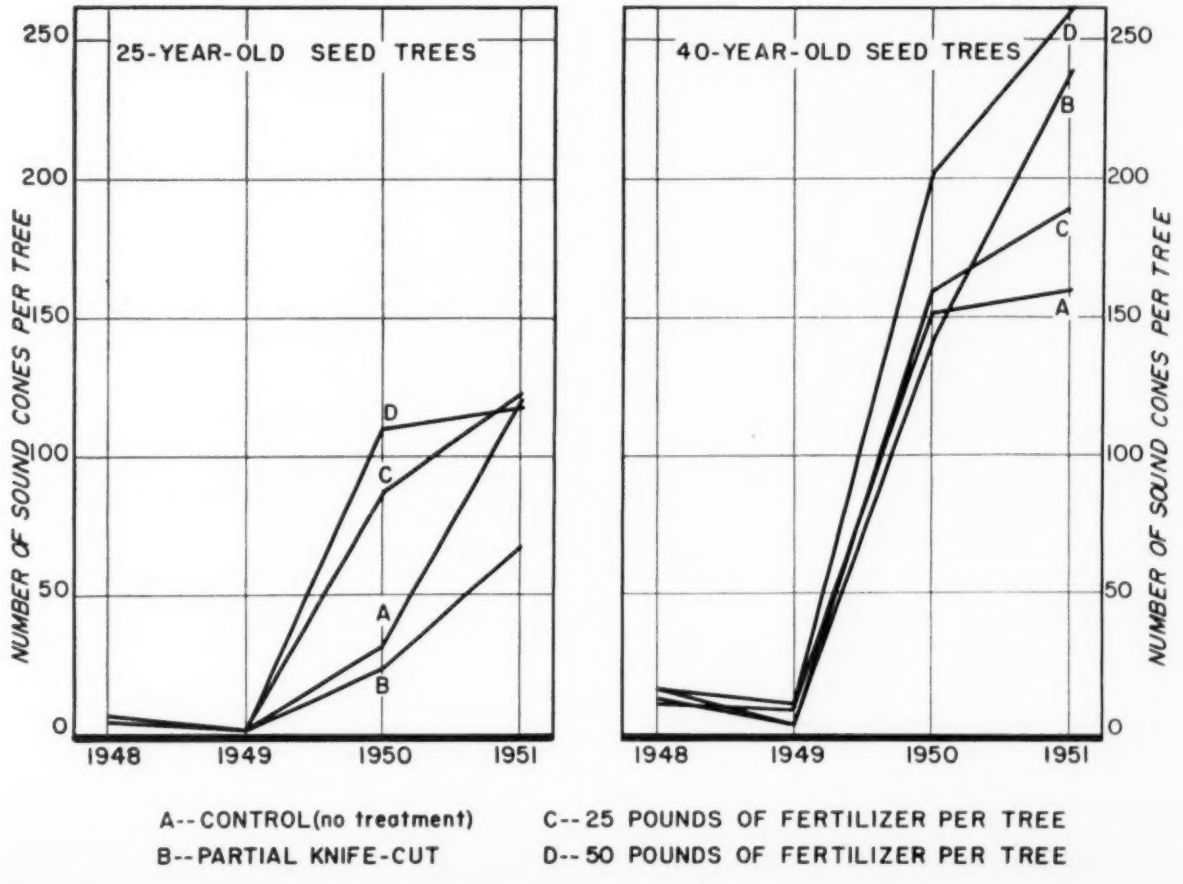

FIG. 1.—Trend of annual cone crops for treated seed trees (sound cones only).

amount of foliage would still have been present during the second growing season after fertilization.

Although the level of cone production in the older stand was much higher than in the younger, the effect of fertilization was not significant. The trends of cone crops over the years since treatment, shown in Figure 1 (sound cones) in comparison with the regional trend suggest the reason for this behavior. During the first three years, 1948 through 1950, the regional level remained low but in the last year, 1951, it rose nearly to the level of the bumper 1947 crop (7). Since the large increase in cone crops of the 40-year-old trees in 1950 occurred in the face of generally unfavorable conditions just three years after release, it can be attributed mainly to the effect of release. In the younger stand only the trees that had been fertilized increased their cone production substantially, and even then not nearly so much as the older trees. The great response of the older trees to release may have obscured the effect of fertilization, or it may be that even the heavier fertilizer application was not enough to increase cone production significantly in the larger trees. The larger average cone crop on the heavily fertilized trees, 53 cones per tree more than on the lightly fertilized trees, although not significant, does suggest an effect of fertilization that might have been enhanced by heavier applications.

The further increase in cone production by both age classes in 1951 was apparently caused partly by the continuing effect of release and partly by the improvement in climatic and cyclic factors. Fertilization contributed little, if anything, to that increase since cone crops on fertilized trees were not significantly greater than those on unfertilized trees.

None of the treatments significantly changed the percentage of defective cones, the total number of seeds per cone, or the percentage of sound seeds per cone.

Practical Aspects of Artificial Seed Tree Stimulation

Since the knife-cut girdling treatment apparently was not severe enough to cause an increase in cone production, little can be said about the practical usefulness of such methods. The possibility exists that injury treatments on a practical scale might result in considerable mortality or might reduce the vigor of the trees enough to make them highly susceptible to insect and disease attack.

The responses to fertilization by trees of both age classes suggest that fertilization can increase cone production significantly only in very young trees. Good forest management does not permit loblolly stands as young as 25 years to be harvested; consequently the occasions when fertilization might be used to increase seed production would be quite limited in practice. And even though fertilization might substantially increase seed production of young trees, initial establishment of reproduction might not be much greater because of the decline in favorability of post-logging seedbed conditions during the three years needed for fertilization to be reflected in seed production. The results of this study thus suggest that fertilization for seed production is not very promising for use in practical loblolly pine management.

The highly desirable coincidence of a plentiful supply of seed and a fresh seedbed can be assured by a more practical way of stimulating seed production—the selection and release of seed trees three years or more before the harvest cut. An investigation of that method will be reported in a forthcoming publication.

One situation in which fertilization of seed trees is likely to be more profitable than in regenerating a single stand is in seed orchard culture. Interest in seed orchards is growing because of the increasing need for planting stock and because of the realization of the benefits to be gained from using seed of good genetic quality. The prices paid for loblolly cones in the last few years, $2.00 to $3.00 a bushel, are in line with those paid for other orchard crops and therefore would justify considerable cultural work in seed orchards. The results of this study suggest that fertilization can increase cone production enough to make its use profitable in seed orchards but nutrient requirements, fertilizer composition, methods of application, need for cultivation, and similar problems, would have to be studied before proper fertilization regimes could be prescribed. Problems of that kind can be studied more efficiently in a seed orchard itself than in seed-tree cuttings aimed at regenerating stands.

Summary

Twenty-five isolated seed trees in each of two locations were treated in one of the following ways: (A) no treatment, (B) knife-cut girdle halfway around the stem, (C) 25 lbs. of 7-7-7 fertilizer per tree and (D) 50 lbs. of 7-7-7 fertilizer per tree.

The knife-cut girdle produced no increase in cone crop.

In the 25-year-old stand lightly fertilized trees produced 98 cones per tree and heavily fertilized trees produced 123 cones per tree in the first effective year (third growing season after treatment) compared to 36 cones per check tree. The difference between lightly and heavily fertilized trees was not statistically significant.

Forty-year-old trees did not respond significantly to fertilization but produced 209 cones per tree compared to 71 cones per tree produced by the younger stand. This greater production was attributed to a greater effect of release on the older trees. The results suggested that the amount of fertilizer applied was insufficient for the larger trees or that the effect of fertilization was obscured by the great response to release.

The effect of fertilization was no longer significantly evident in either stand in the second effective year, although average cone production was greater. The increase

was attributed mainly to the continuing effect of release combined with more favorable climatic and cyclic factors.

Treatments did not significantly affect the percentage of defective cones, the total number of seeds per cone, or the percentage of defective seeds per cone.

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Common Molds Affect Wood Properties[1]

The common green molds that discolor the surface of peeled and sawn pine wood can no longer be considered unimportant. Recent studies show that they greatly increase the permeability of southern pine wood to oil and water, and that—if established quickly on freshly cut surfaces—they retard the development of some decay-causing fungi. They cause no significant losses in most strength properties of the wood.

Absorption was tested by soaking seasoned southern pine fence posts in an oil-based preservative (5 percent pentachlorophenol in dark petroleum oil). The posts were 3 to 4 inches in diameter and end-coated to prevent penetration from the ends. In five minutes, heavily molded posts absorbed 9 pounds of the preservative solution per cubic foot of post, as compared with 5 pounds for posts with light to medium mold and 1 pound for those with no mold. The preservative often penetrated the heavily molded posts completely, but it seldom went more than 0.1 inch into the sides of fungus-free posts. Pick-up of water was similar. During 2 days of drizzling rain, heavily molded posts absorbed 28 to 30 pounds of water, whereas unmolded posts took up only 7 or 8 pounds.

These findings help explain the variability often encountered in the development and application of schedules for applying preservatives. Obviously, a schedule suited to one lot of wood is unlikely to give similar absorption and penetration on another lot with a different degree of mold infection. Such infections can, however, be kept within reasonably uniform limits by seasoning the wood in open piles or by spraying it with a fungicide.

Dip or spray treatments with fluoride solutions encourage heavy development of green mold. The mold in turn, through some antibiotic or competitive effect, helps check some important decay fungi. In recent tests this fluoride-mold sequence greatly reduced losses in stored pine pulpwood. At present it seems more effective on pine pulpwood than the commonly used chlorinated phenol or organic mercury fungicides.

The preservative treatment of wood may perhaps be facilitated by first using the fluoride solutions to induce molding. Before this is attempted, however, it will be necessary to learn how well the permeable molded wood retains preservative. The increased pickup of rainwater may also prove a disadvantage for products exposed to the weather either before or after preservative treatment.

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[1]Southern Forestry Note No. 83, Southern Forest Expt. Sta., New Orleans, La.

The Role of Humanities and Other Liberal Courses in the Professional Forestry Curriculum[1, 2]

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THIS PAPER reflects the composite attitudes of some seven hundred practicing foresters. They provided the information I have summarized for you.

Conflicting views and opposing interpretations require a brief discussion of the definition of our topic. The terms "humanities," "liberal subjects," and the closely associated "general education" signify many things to many people. This is due to the divergent views, presently in vogue, of their real meaning. Although the general objective of liberal education is fairly well agreed upon, the particular mechanism of securing it is not so well understood.

Liberal education as provided in the "humanities," "liberal subjects," and "general education" is intended to encourage the student in the fullest possible development of his capacities as a person and a member of society. Few will dispute this concept. Disagreement arises when the discussion turns to the specific disciplines that are essential in achieving the goal.

I intend to use the term liberal education in its broadest sense. In this paper, it will include the "classical humanities" (grammar, rhetoric, literature, mathematics, logic, and fine arts) together with the "modern humanities" (anthropology, economics, sociology, modern language, history, and geography). It will embrace all knowledge about man. Interpreted in this sense, humanities and liberal education are synonymous with social sciences.

A Study in Forestry Education

Humanities and other liberal courses are only a part of forestry training. The role of these disciplines may be seen in proper perspective only after a look at the overall picture. What should a young man learn at forestry school? The answer, with all its ramifications, is of paramount importance. The individual needs sufficient technical knowledge to earn a living as well as a fundamental sense of values which will enable him to lead a full and well adjusted life. The profession depends upon the ethics and quality of its members for moral tone and progressive development, and the nation expects the forester, as an educated man, to assume the responsibilities of citizenship in this great democracy. It is the task of the schools, and of society—the home, the church, and so on—to meet this challenge in education.

There is little doubt that almost every graduate of an American forestry school has, at one time or another, weighed what he learned in college against the knowledge he felt he should possess to function best as a forester and a free citizen. Thus, the question of training has been personalized and probably answered not once but many times by most practicing foresters. In 1949-50 I undertook to discover just what knowledge and skills the average graduate believed necessary for the successful pursuit of the profession. A mailed questionnaire was used to secure this information.

The Sample

The value of the study rested upon the representativeness, the professional education, and the post-graduate experience of those furnishing information. Thus, reference to the composition of the sample may make results of the study more acceptable. Several factors were considered in selecting the group to be queried. First, only those persons were included who appeared to be working in the type of forestry job that a graduate of general forestry or forest management might be expected to fill. Second, the sample was confined to foresters located in the Northeast, South, Far West, and Washington, D. C. Finally, all graduates of Yale, University of Michigan, and the State University of New York College of Forestry, together with a selected group of graduates of other schools were included if they apparently met the first two qualifications. The restrictions were made so that sample totals would remain within manageable proportions, yet the component subgroups would be sufficiently large to permit statistically sound manipulations.

Questionnaires were mailed to the sample in 1949. It was most gratifying when the final returns showed a response of about seventy percent—furnishing a working sample of over seven hundred practicing foresters. A check back on the composition of the sample against a known listing of all graduates of one college indicated that the sample was fairly representative of the whole forester population.

Some confidence may be gained by noting that a number of individuals of responsibility and prestige in the forestry field returned questionnaires. Identified in the group are at least sixteen state foresters, two Forest Service regional foresters, nineteen forest supervisors, four directors of forest and range experiment stations, two National Park Service superintendents, one Indian Service forest supervisor as well as prominent private and consulting foresters whose position titles are perhaps not so clearly defined and subject to classification. It is quite likely that additional returns were received from persons of high rank who could not be identified because of the anonymous nature of the questionnaire.

The Survey Instrument

The questionnaire was designed to find areas of desirable knowledge

[1]Paper presented at the joint S. A. F.-C. I. F. meeting, Montreal, Canada, Nov. 1952.

[2]Extracted from unpublished thesis entitled "a statistical approach to curriculum development in forestry" for Ph.D. at the State University of New York, College of Forestry.

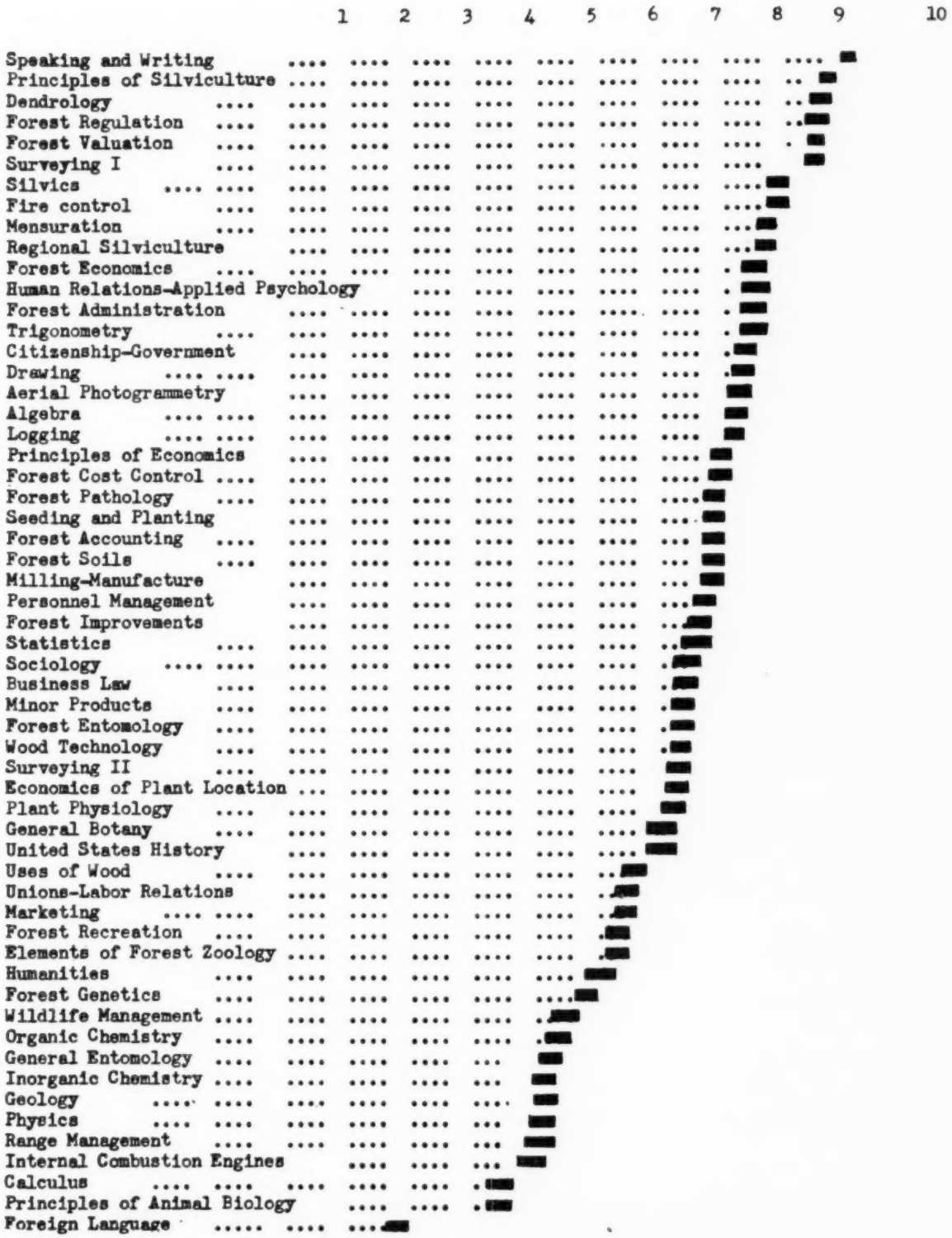

FIG. 1.—Courses ranked in order of their rated importance[1] and zones within which the average (arithmetic mean) for each course would be expected to occur 19 out of 20 times with subsequent samples.

[1]Scale points ranging from 0-*NO* importance to 10-*UTMOST* importance.

and skills in terms of courses of study. Descriptions of subjects were used rather than conventional course names. All too often, because of course presentation or instructor personality, a particular name may have a definite connotation that is unrelated to the importance of the knowledge pertaining to the subject. We wanted our respondents to look at the courses objectively in terms of their usefulness to the individual on the job and not in light of previous school experience.

Fifty-seven subjects were selected as having some conceivable importance to the forester. Certainly the list was not all-inclusive. However, the major biological, physical, social, mathematics-engineering, and technical forestry areas were sampled. The chosen subjects included all of the orthodox general forestry courses as well as several that are a far cry from the usual curriculum listings.

A rating scale was provided with each course description. Thus, each course was treated as an entity by the respondents. An evaluation of relative value of disciplines was not made by the rater. Instructions on the questionnaire were as follows:

> We would like your assistance in determining the *knowledge* or *skills* a successful forester should possess. Following is a list of statements about fields of knowledge or skills each of which *you* may or may not think important to the success of a forester. Would you please indicate your attitude to each statement by circling one of the numbers on the scale to the left of the statement. 0 point stands for *no* importance, the scale point 10 stands for *utmost* importance. The intervals 1-9 indicate even graduations between these extremes. Your ratings should be based preponderantly on *your own experience*.

The survey instrument was completed by the inclusion of a series of questions that would permit the sample to be classified into various categories.

Results of the Study

Overall Ranking of Subjects

The arithmetic mean of the ratings was calculated for each of the subject descriptions included in the questionnaire. Based upon this average, the subjects then could be ranked in order of their rated importance. The relative position of courses in the array manifests the combined thoughts of the respondents about the needs of the successful practicing forester for the described subjects. The array is presented in Figure 1.

We can observe that a number of the subjects falling in the top half of the array are not now found in the usual forestry curriculum. For the most part these are the liberal courses. On the other hand some of the generally accepted "forestry" disciplines are located in the bottom half.

A brief explanation of the statistical measures relating to Figure 1 is in order. The blocked-in zone for each course indicates the range within which the arithmetic mean would be expected to occur for nineteen out of twenty subsequent samples. The upper and lower limits of each zone were defined by the relation of $\pm$ two times the standard error of the mean. It is apparent that at this level of statistical reliability, the anticipated rearrangement of courses by other practitioner samples would not be great.

Analysis of Group Opinions

The classification questions made it possible to divide the sample into sub-groups and determine average sub-group opinion for each course. Thus, comparisons could be made among sub-groups differentiated by employer, type of job, region in which working, salary, college attended, etc. Almost without exception the greatest differences in opinion were found in the analysis of sub-groups defined by their type of job. Job classifications were land management, logging, administration, research, extension-public relations. Apparently these sub-groups are more likely to have opposing opinions on forestry education than are sub-groups of practitioners differentiated by other characteristics.

The influences of various forestry schools upon the opinions of their graduates are also disclosed. The results are most revealing. Of the fifty-seven course ratings there is not a single instance of a statistically sound difference of opinion among the school groups, Yale, Michigan, New York, and others, concerning the merit of a particular subject. Seemingly, the college which a forester attended exerts a relatively minor influence on his professional attitudes and opinions as respects the points brought under consideration in this study.

The Common Courses in General Forestry

What constitutes the basic, common fund of knowledge of professional forestry? This question, a most controversial one, is presently receiving much attention. Personal interest has often beclouded objective consideration of the matter.

Here we can analyze the opinions of a large number of foresters, employed in a variety of jobs, about the essentials of forestry. Thus, it may become possible, through examination of those opinions, to discern the group of subjects which comprise the basis of understanding for general forestry. Evidence is thereby substituted for individual pronouncement.

A comparison was made of the thirty subjects rated highest by each of the type of job groups, i.e. land managers loggers, administrators, research men, and

TABLE 1.—COMMON SUBJECTS FOUND IN EACH OF THE TOP PREFERENCE LISTS OF ALL FIVE TYPE OF JOB GROUPS[1]

Speaking and Writing	Algebra	Dendrology
Citizenship Government	Trigonometry	Silvics
Human Relations	Surveying I	Practice of Silviculture
	Aerial Photogrammetry	
Principles of Economics	Drawing	Forest Pathology
Forest Cost Control	Mensuration	Fire Control
Forest Valuation		
Forest Economics	Logging	Forest Regulation

[1]Courses are listed by subject matter, not order of importance.

extension-public relations specialists. Certain courses were found in each one of these five top preference lists. These might be said to constitute the common courses that are the core of general forestry. Table 1 lists these subjects.

The Role of Liberal Subjects in Forestry Education

The individuals participating in the study were requested to rate the subjects according to the importance of that information to their success as a forester. Certainly this request would tend to stimulate thinking along professional lines.

However, the results of the survey should support the belief held by many that the practice of forestry is appreciably broad and liberal. The foresters replying to the questionnaire placed a high relative value on those areas of knowledge which are concerned with social relationships and life in the community—the liberal subjects.

Referring once more to the array of courses according to their average rating, we observe that our sample believes the ability to speak and write effectively is the most important attribute a forester may possess. This skill ranks well above all others. Further, Human Relations, Citizenship-Government, and Personnel Management are all included in the top half of the ranked subjects. Sociology narrowly misses the top group and it is likely that some subsequent samples might place it there. Also, History of the United States was considered more important than Uses of Wood, and the study of Classical Humanities more important than Forest Genetics or Wildlife Management.

A sizeable number of the respondents amplified their scoring of the subjects described in the questionnaire with written comments. This contribution was over and beyond the rating of the statements and would probably reflect a rather strong opinion on the part of the respondent. These comments offer substantiating evidence to the average results of the scoring. They may be grouped into the following classifications:

Comment	*Percent of sample expressing an opinion on the topic*
Ability to speak and write clearly, concisely, and convincingly; salesmanship	9
Understanding of human relations, ability to work with and understand people; personnel management	9
Better acquaintance with social sciences; understanding of administration; business methods; economics; accounting; cost accounting.	6
Broad, basic, adaptable education	6
Understanding of social needs; apprised of community and citizenship responsibilities	5
More practical experience and training	5
Include more of humanities in academic training; more education for living	3
Ability to analyze problems; development of good judgment; objective scientific approach	3
Miscellaneous	4

This would seem to indicate that the schools are doing a good job in professional education. Only five percent of the respondents were so concerned with needed improvements in forestry instruction that they made the effort to mention it specifically. The major deficiencies appear to lie outside the traditional professional area—a new supplementing area in forestry training—the area of liberal subjects, the social sciences.

An evaluation of the opinions of College of Forestry graduates, State University of New York, made by Dr. Paul F. Graves in 1950 permits a broader generalization of the attitude of foresters about the adequacy of their professional training. Approximately seventy percent of the entire alumni group of this institution, a total of 1268 persons, responded to Dr. Graves' questionnaire. In addition to general forestry, this sample included graduates of curricula in pulp and paper manufacture, wood technology, wood utilization, and landscape and recreation management. In the findings and conclusions of this study Dr. Graves states:

> There has been no indication of any lack of technical proficiency on the part of the graduates. . . It was found that none of the graduates of any period listed a need for more technical training. Also, large numbers of the alumni have pointed out the high quality of the basic technical training they received.
>
> Forestry as a growing profession seems no longer served effectively by the graduate who is primarily a technician. Graduates reported heavy inadequacies in their educational preparation concerning the broader overview necessary for fitting their work into the needs and welfare of society, and also concerning the human relationships and responsibilities of democratic living. . . . Alumni exhibited a strong feeling that considerably more non technical instruction should be made available, most emphasis being given such subject areas as social sciences, human relations, government, communications, business, psychology and philosophy.

Thus, the more specific findings of my study are somewhat ramified and broadened by Dr. Graves' survey to encompass the overall profession.

What this Means in Terms of Forestry Education

Forestry in this country has long been recognized as a combination of natural and social sciences. At the turn of the century, it was observed, in effect, that the forester must work with people as well as trees. Pinchot wrote in 1914:

> The usefulness of the Supervisor (Forest Service) depends as much upon his good judgment, his ability to meet men and do business with them, and his knowledge of local needs and local affairs as it does upon his knowledge of the forest itself.

Yet, it appears that many people have either failed to possess the strength of their convictions or did not catch the full import of the idea. An examination of the present forestry school curricula supports this statement. Courses dealing with the understanding of and ability to get along with people are conspicuous by their absence.

In this very important consideration, it would appear that the field practitioner respondents are more liberal in their concept of essentials in forestry training than are the forestry schools. We must heed the counsel of the state forester who said, "A professional training will

help a man secure a job, but the manner in which he gets along with people and the horse sense which he uses in applying his professional training will determine his success or failure in performing the job." We must heed the regional forester who advises, "I believe that most of the failures are personal problems which develop with our personnel as a result of the individual's inability to get along with his co-workers, his superiors, men under his supervision, or other folks with whom he comes in contact in the performance of his work." We must listen to the lament of the young forester that he failed on his first job because of the lack of training in human relations. The list of such comments is long. Certainly, the forceful expression of the respondents is mandate for a change. We should expect that the schools more nearly fulfill their obligation to the student and to society.

It has always been the problem of these educators who would help to bring about curricular changes to persuade others to give up what was once a good arrangement even when it has long ceased to provide the best service. Perhaps the force of the opinion expressed by the large samples in the two mentioned surveys will be sufficiently great to overcome curriculum inertia.

Having noted the shortcomings of forestry education in respect to liberal education, the responsible critic should offer suggestions for improvement. Corrective measures might proceed along several lines.

First, the forestry course of study should not be so burdensome as to prohibit most students from participating in extra-curricular activities. Much can be gained by active interest in the college life outside the classroom. Many alumni have charged that they failed to derive the maximum benefit from their college experience because of heavy schedules.

Second, the technical forestry courses may be used as media for providing some liberal education. Reports, term papers, class discussion, and talks by students in the classroom may do much to improve skill in communication, providing the instructor is conscientious and thorough in his assistance to the student and his criticism of the presentation. Forestry camps are ideal for training in leadership, in social responsibilities, and in general experience in getting along with others.

Finally, according to the foresters participating in the survey, there should be a change in course emphasis. The shift seems to be from the biological and more especially the physical sciences toward the social sciences. Speaking and writing, citizenship, human relations, and economics were stressed by the respondents. Yet, these subjects are not displayed as prominently in forestry college curricula as are some of the lower rated biological and physical sciences. Courses designed to offset the deficiencies should be incorporated into the curriculum.

In conclusion, the force of respondents' opinions makes it apparent that the present scheme of education does not fully meet the needs of the practicing forester. They imply that certain additional liberal subjects are essential for the successful practice of forestry. Many advise that the burden of heavy scholastic loads must be lightened to permit the student the maximum benefit from the collegiate environment. To accomplish this, it is obvious that deletions or course combinations must be made in the present orthodox course of study. This is the challenge to forestry educators. Forestry education must keep abreast of the dynamic needs of a growing profession and a complex society.

Notes

A Method of Direct Seeding in Rodent Infested Areas of Summer Drought

In the JOURNAL OF FORESTRY, 48: 443-44 (September 1950), Gustaf Juhren reported success in a southern California experiment in protecting direct seeding from animals by the use of beer cans. Mr. Ezra Miller of the Los Angeles county Department of Forester and Fire Warden has developed another method of accomplishing the same result and more.

With one or two strokes of a large combination hoe-rake the planter chops about eight inches into the soil; he breaks this soil up and tamps it firmly back into place with the tool; then into a tiny depression made by a wing-nut on the tool he puts two or three seeds (pre-germinated or not, according to the species and time of planting) and barely covers them with soil. Next he lays on a four-inch square of newspaper or toilet paper and covers it with mineral soil to a depth of one-fourth to one-half inch according to the size of the seed; and firms, then gently rakes the surface. The entire operation takes 30 to 45 seconds.

The eight-inch digging aerates the soil, improves moisture penetration, and makes sure there is no large rock to obstruct the taproot. The paper prevents the aroma of the seeds from coming up, and so animals and birds do not find the seeds. Also the paper, even after it has become decomposed, greatly reduces evaporation from the soil.

In fall plantings Miller uses newspaper; the winter rains soften the paper enough to let the cotyledons push up through. Sometimes to make sure he cuts a small incision in the paper. In later plantings he uses the thinner toilet paper.

With this method Miller has had very high survival in rodent infested areas and under the most adverse weather conditions. During the past four winters he has established good experimental stands as follows:

1. On new burns at Flintridge, at an elevation of 1,600 feet, and near Saugus, elevation 4,000 feet—*Pinus coulteri* and several other species.
2. On road fills of the Angeles Forest Highway, elevation about 4,000 feet—*P. coulteri* and others.
3. At Little Gleason, elevation 6,000 feet, where brush had been bulldozed out—*Pinus jeffreyi* and others.
4. At Horse Flats, elevation 6,000 feet, in a ponderosa-Jeffrey pine area where the forest is scanty because soil conditions prevent the natural seed crop from reaching mineral soil — *P. jeffreyi* and *P. coulteri*.

In some areas birds nip off the seed hulls as soon as the cotyledons lift them above the surface. Where experience shows that this happens, Miller applies a small conical wire screen fastened securely to a stake which is driven part way into the ground. Cans give protection against this type of injury but they sometimes damage or kill seedlings during hot weather by causing overheating.

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Cost of Pruning Longleaf Pine

The benefits of pruning longleaf pine have often been pointed out, but the costs have received less attention because most longleaf pruning has been on a small scale. This note reports the costs of pruning more than 4,800 longleaf pine trees on the Palustris Experimental Forest, near Alexandria, Louisiana.

The work was done in 1950, in a 100-acre plantation established in 1934-35. Trees had been planted at rates ranging from 250 to 2,500 per acre, but by 1950 most of the area was relatively open and typical of commercial longleaf plantations in Louisiana.

Treatments tested were: 1. Pruning all trees to a height of 17 feet; 2. Pruning about 100 of the best trees per acre to 17 feet; 3. Pruning 100 of the best trees per acre to two-thirds of the total height of the tree.

Pruning was done by a two-man crew under close supervision. Each man had a hand pruning saw and a pole saw with a sectional aluminum handle. The hand saw was used exclusively on branches up to 7 feet above ground, and the pole saw exclusively on higher branches. The pole saws had 20-inch curved blades cutting only on the pull stroke and adjustable heads to vary the angle of the blades.

Results

Size of tree significantly influenced pruning costs (Table 1). Total work time, including walking time and a prorated share of delay time, ranged from 3 man-minutes for trees 4 inches d.b.h. to 6 minutes for 8-inch trees. At labor rates of $0.85 per hour, plus $0.25 for transportation, supervision, insurance, and overhead, pruning costs per tree averaged from 5.4 to 11.1 cents. The advantages of pruning when trees are small is highlighted by the fact that the cost for a 4-inch tree was less than half that for an 8-inch tree.

The average time of one-log pruning of about 100 trees per acre under each of four different stand densities is given in Table 2. Stand density had no pronounced effect on average pruning time per tree. The ease of getting about in open stands somewhat offsets the added labor of pruning the large branches that open-grown trees develop. Where all trees were

TABLE 1.—TREE DIAMETER AND AVERAGE PRUNING COSTS (INCLUDING DELAY AND WALKING)

D.b.h. (inches)	Cost per tree	
	Minutes	*Cents*
4	2.95	5.4
5	3.24	5.9
6	4.11	7.5
7	4.67	8.6
8	6.07	11.1

TABLE 2.—TIME PER TREE OF SELECTIVE PRUNING TO 17-FEET IN STANDS OF VARIOUS DENSITIES

Trees per acre (number)	Average diameter of pruned trees	Trees pruned per acre	Total pruning time per tree
	Inches	*Number*	*Minutes*
505	5.5	100	3.39
340	5.4	100	3.71
298	5.8	100	4.01
87	5.8	84	4.04

pruned to a height of one log in stands ranging from 30 to 111 trees per acre, cost per tree was similarly unaffected by stand density.

Pruning above the first log was expensive. This was demonstrated when pruning to two-thirds of the total height of the tree was compared to one-log pruning in stands of comparable stocking. In both types of pruning, 100 trees per acre, averaging 6 inches in d.b.h., were treated. High pruning averaged 23 feet up the bole, or almost 1½ logs, and required 5.50 man-minutes per tree. One-log pruning required 3.29 man-minutes per tree.

Summary

In summary, pruning of longleaf pine appears most practical when trees average from 4 to 6 inches d.b.h. Longleaf trees of this size will exceed 30 feet in total height. They can therefore be pruned to one log in a single operation and will retain over 40 percent of their live crown, which is enough for continued rapid diameter growth. Cost of treating trees of this size is relatively low. This study indicates that one hundred such trees per acre can be pruned for about $5.50 to $6.00. Pruning to 1½ logs would almost double this cost.

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The Association of Consulting Foresters[1]

Shortly after the close of World War II, the number of consulting foresters in the United States had increased to several times the number engaged in that work when the war began. As the number steadily grew, some of the newcomers felt an increasing need for something which would help them with the problems encountered in what was to them a relatively new and growing field of enterprise.

These new problems were myriad, but among the more important were how to preserve the good reputation of the forestry profession against incompetent and dishonest individuals who cared only for a temporary personal gain, and how to exchange information of particular and peculiar value to forestry consultants. Even before the adoption of a code of ethics by the Society of American Foresters most members of the profession adhered to certain well known ethical standards, but, as in any large group, it was inevitable that a few would not do so. There were some so-called consulting foresters who were not members of the Society either through choice or because they lacked eligibility. The Society's JOURNAL OF FORESTRY, while a valuable aid to the new consultants, could not provide some types of information for which they began to feel a special need.

Correspondence between a number of the consultants brought these and similar problems into sharp focus, and some of them agreed to explore the question of forming an organization at the 1948 annual meeting of the Society of American Foresters at Boston. The Society provided a meeting room and cooperated in every way possible to insure a successful meeting. Those who attended the meeting were not the consultants alone, but there were representatives from nearly every branch of the profession.

The Boston meeting convinced most of those who were actually in the consulting field that an organization of consultants was badly needed. There was some discussion as to whether the new organization should be a division of the Society of American Foresters or completely independent. In view of the fact that the Society already had a large number of divisions with the attendant problems of meeting places and schedules, the fact that some bona fide consultants were not members of the Society, and the Society, and the fact that all divisions were more or less "open" to all Society members, the latter course was chosen.

The start made at Boston led to subsequent meetings and to the formation of the Association of Consulting Foresters. A constitution was adopted and the organization was incorporated under the laws of the state of North Carolina.

The constitution provides that only bona fide consulting foresters may become members of the association, and the qualifications for membership are set forth as follows:

(a) Possession of a degree from a college or university approved by the executive board of this association.

(b) At least five years experience in practical forest administration and management including one year as a consulting forester.

(c) A consulting forester is defined as a technically trained professional forester who devotes not less than 75 percent of his working time each year to performing any

[1] *Editor's Note.*—The Association of Consulting Foresters, while not a Division or affiliate of the S.A.F., is closely related as to membership. It holds one of its two annual meetings in connection with the S.A.F. annual meeting and this meeting is open to attendance by non-members of the association.

or all types of technical forestry work including the protection, development, management and utilization of land and forest resources. His work is done on a fee or contract basis and his services are available to the general public rather than to a single full-time employer.

(d) Payment of initiation fees and dues as established by the association and set forth in the by-laws.

(e) The association acting through its executive board shall be the sole judge of the qualifications of the members, except that appeal may be taken from the decisions of the executive board as provided in the by-laws.

As a result of the prerequisites, many applications for membership in the Association of Consulting Foresters have been disapproved. A large membership is not the aim of the association, but rather the maintenance of high standards of conduct and performance within the consulting branch of the profession.

Through its executive vice president in Washington, the association keeps a close watch on proposed forestry legislation, and it has actively opposed bills it considered harmful to the profession and to the welfare of American enterprise and supported those it deemed beneficial.

A personalized, impression-type seal has been designed which members may use on their professional reports and maps to proclaim their membership in the Association of Consulting Foresters and to symbolize reliability.

J. Atwood Whitman,
Consulting Forester,
Glendon, North Carolina.

Redcedar Nursery Tests by T.V.A.

Since 1949 T.V.A. has conducted exploratory studies on the production of redcedar seedlings at three nurseries: the Norris Experimental Nursery and the Clinton Nursery in Tennessee, and the Muscle Shoals Nursery in Alabama. Some of the seed used in the studies was collected locally from trees of varied form. Some for use in seed-source tests came from cooperators in Alabama, Mississippi, and South Carolina. The tests covered these phases of nursery practices: seed treatment, seeding dates, covering of seed, mulching and shading of seedbeds, and the use of Special Semesan for control of the Phomopsis blight.

Here briefly are the results:

1. Seed should be extracted from berries and cleaned in October or November. It should be planted then or stratified for planting in January or February.

2. Drill seeding makes for easier weeding than broadcast seeding.

3. Soil proved to be a much better seed covering than compost.

4. Depth of seeding and moisture are important. Soil covering should be no more than ⅛ inch and it should be kept moist.

5. Mulching beds with burlap gave significantly better germination than sawdust, pine needles, or no mulch.

6. A polythene plastic film, No. 200 gauge, proved valuable in retaining soil moisture. This sheet was spread over the seedbeds after seeding and removed when germination started. This eliminates the need for irrigation during dry periods in winter.

7. Germination of eight seedlots planted over a 4-year period ranged from a low of 0.1 percent to a high of 50 percent.

8. Lath shading during the summer was not beneficial.

9. Special Semesan used as a spray for control of the Phomopsis blight was effective. However, in spite of weekly spraying and removal of diseased seedlings, there were some losses.

10. Mineral spirits was effective in the control of grasses and some weeds. Seedbeds should be irrigated at least 2 hours before spraying for weed control. Spraying should be done when air temperature is below 85 degrees Fahrenheit.

11. Plantable seedlings (1,0) ranged from 45 to 78 percent of the number that germinated.

Further studies are needed on the control of Phomopsis blight. In spite of current control measures, this disease still causes heavy losses. Spreaders or stickers might make Special Semesan more effective. Other chemicals should be investigated.

Frank E. Blow, John F. Hatmaker, and T. V. Lehto
Tennessee Valley Authority
Division of Forestry Relations
Norris, Tenn.

The Professional Civil Servant

"In our present controversial age, when the growing awareness of the responsibilities of citizenship and the sudden impact of the hideous problem of human disloyalty are whipping our established institutions about like trees in a storm, the position of the professional civil servant can become the center of some of the most severe strains and tensions our society knows. In this day of bigness and impersonality, of security clearances and loyalty investigations, of swollen staffs and managerial specialists—in this day, in short, of the fading vitality of the individual relationship in government—it requires a special manliness and fortitude for the civil servant to stride confidently along the path of his duties, to retain his serenity of mind and confidence in the future, to find the deeper roots of understanding of his own country and the deeper sources of faith in the utility of what he is doing."

George F. Kennan,
The Atlantic Monthly, May 1953.

Points of View

Comments Upon "An Open Letter to the Secretary of Agriculture"

June 11, 1953

Mr. Christopher M. Granger
River Road
Bethesda, Maryland

Dear Chris:

After reading your open letter of March 10 to the Secretary of Agriculture,[1] as published in the Society JOURNAL for June, I would like to make sure that you understand just what is in my mind.

I am sure that you do not associate the group of the Forest Industries Council, who met with Secretary Benson on January 27, with any movement to disrupt the national forests. There are, however, several current questions regarding the future enlargement of the national forests and their relationship to other types of ownership which interest not only the Forest Industries Council but the foresters and forest industries of the country generally. Among these questions are:

1. For a number of years, the announced policy of the Forest Service has been to add approximately 34 million acres to the existing national forests. This acreage represents, I believe, the approximate total of all land within existing national forest and Weeks Law purchase boundaries not now in government ownership. I do not know of any change in this reiterated program in the Forest Service. Does it represent the present policy and working program of the government?

2. In some Weeks Law purchase units, particularly in the South, only a small portion of the areas laid out as purchase units have been acquired. Further acquisitions appear to be stymied by the rising prices on the remaining lands. The government is operating small administrative areas, of high cost and uneconomic size. What does the government propose to do in these situations?

3. There is a great deal of current questioning from state and private sources and apparently uncertainty on the part of the Forest Service, in respect to the extent to which further private lands should be acquired by the government under the exchange legislation. Just what is the policy of the government in respect to further extensions of the national forests under "stumps for stumpage" and other types of land exchanges?

I am, of course, not attempting any complete resume of the subject; simply to indicate the types of questions that exist. They vary in nearly every state. Another important phase of the general situation is the relationship of federal forest ownership to the expanding areas of state forests in many situations; to the county forests in states like Wisconsin; and to the expanding acreage of tree farms and other private forest areas now under intensive and productive management.

The idea has been growing in my mind that the time is here for a real, grass-roots study of the desirable pattern of forest ownership under the conditions as they exist today, not as they existed when the Weeks Law was enacted. And such a study is related so directly to the future course of federal ownership, that I believe it should be initiated by the Secretary of Agriculture. I do not believe that these complicated land problems can be disposed of by any short-cut legislation. And I am anxious personally that the study be directed by agencies fully in sympathy with the past development and progress in the national forests. It has seemed to me most logical that such a study be, in effect, an administrative review of the present area and status of the national forests and their desirable extensions, directed and correlated by the responsible ministry of the federal government. But I also am convinced that such a study must recognize the innumerable differences between conditions in the various states by providing for some form of initial study within each state by the men and agencies who are best informed on state conditions and needs. Obviously, all separate state studies must also be reviewed and correlated by some overhead national agency. This would be the responsibility of the Secretary of Agriculture; and might very well be implemented by such a commission as your letter suggests.

Up to this point there seems to be little difference between your viewpoint and my own. But you gag over the word "eliminations." Apparently the study you propose would be limited strictly by an injunction that only the maintenance or enlargement of existing national forests may be considered. Under no conditions, apparently, would you give the reviewing groups license to recommend the elimination of a single acre from an existing national forest.

I find it hard to believe that, with your very extended knowledge of national forest administration and the conditions in the many states where they exist, you actually mean this prohibition seriously. To me it is neither honest nor realistic to undertake a basic re-survey of forest ownership in this country and then restrict the surveying groups by an arbitrary rule against any eliminations under any conditions. The study had best not be undertaken by the department but left in the hands of Congress, if its purpose as an aid in developing our forest economy must be limited at the outset by such a prohibition upon scientific inquiry. It suggests the attempted control of scientific inquiry in Russia, where I believe the processes of evolution must always be related to environment and under no conditions to heredity.

If such a review of land ownership is to be undertaken by the department, let it by all means be free to consider whatever situations may arise where in the judgment of the men making the study federal forest ownership should be modified by either eliminations or extensions. There will be ample oportunity under the department's over-all control to review the recommendations from each state and to fit them into a harmonious federal policy. As I attempted to point out to Secretary Benson in the letter to which you refer,[2] I believe it would be far more constructive for the department to undertake a review of this nature on its own motion rather than let the situation drift into the possibilities of political action.

Very sincerely yours,

W. B. GREELEY,
Vice President, West Coast Lumbermen's Association, Portland, Ore.

[1] Granger, C. M. An open letter to the Secretary of Agriculture. Jour. Forestry 51:448-449. 1953.

[2] The JOURNAL has requested Mr. Greeley to make available to its readers a statement summarizing the plan which his group proposed.

June 5, 1953

To the JOURNAL OF FORESTRY:

Mr. Granger's open letter to the Secretary of Agriculture is a sincere expression of concern over a principle of conservation that originated among members of the old school of foresters. I was raised in that old school, was inoculated with the true spirit of conservation, and was taught with all good will and earnestness that the only way to achieve conservation was through public ownership. At the time that attitude was correct. The timber miners were at their destructive worst. The federal forests were the only hope of salvation. The Forest Service has led the way back. They absolutely have stopped the major ravages of cut and leave and certainly deserve full credit with all the recognitions of merit that it is possible to give. And all the way through there has never been a finer bunch of fellows than the ones who participated in the movement.

But the times have changed, the problem has changed, and with it the methods of achievement must change. The conservation principle is still there. The end objective is clear to all of us, private or public. We agree on a perpetual forest with a sustained yield use. We also agree on a multiple use with the greatest good to the greatest number of people. But now our uses have multiplied beyond the water, timber, wildlife, recreation, and grazing categories. It now includes the social necessity of creating permanent communities where more people may live with mutual and conflicting interests which they can solve for themselves by their own local efforts. It is people now that need saving along with the forests, and that salvation must come through intelligent guidance with opportunity to learn by individual practice. Regulation by government is not the American way. The climax forest is not the final dominating specie, but the final community of people, who by their own intelligent choice, perpetuate the resources of their own locality, and live and thrive as a part of the ecological whole. Saw mills and towns and farm units must all work their way into the end picture and all will fit into their proper places while conservation is being served and the greatest good comes to the greatest number of people.

Mr. Granger's objection to the two proposals for a study of the land ownership pattern by state conditions and possible "eliminations" is the result of the fear inherited from the old school. His arguments sound good to the advocates of the powerful central government that can force the ideal into being, through strong regulation of all minor details. Usually such a means to the ideal materialistic end in conservation ignores the human element which in the long run should be the end. The greatest good is a spiritual value where people see, understand, and choose of their own accord those activities which assure materialistic security and spiritual satisfaction. This can only come through voluntary intensive work on the local level with just a word as to the needs of the general security. Government should work on the improvement of people through leadership, education and persuasion. When government takes over the materials of activity and goes into business it robs the people of the means for their development and makes them literally a materialistic cog in a wheel, an inhuman automaton, and the wheel is designed from a single pattern on file at central headquarters.

The policy of the Forest Service by all means should include gradual, well planned disposal of operating units, designed to create perpetual communities which will practice a more intensive conservation fitted to the local problems. This is especially needed in the West where government ownership is way out of balance. As long as large tracts of land are withheld for future markets or utilized with a very extensive type of forestry, and ownership is forever invested with a one pattern distant owner, so long will local full development be held back. It is certainly in order that a study be made on the local level with all affected parties represented. There will not be any scramble and grand scale disposals, for the units will require large purchase sums, which must come from local organization and community cooperation. There will not be any broken working circles, for the disposal should be by working circle units. There will not be any little fellows hurt, for they will be some of the most enthusiastic members of the local projects. A hodgepodge of plans most certainly will develop, for every working circle is an individual problem. But none of these need to violate the sound principles of conservation.

The national forests are truly national when they serve going units of the nation and supply usable goods for the general public from unusable raw material resources. The Forest Service will not suffer from this gradual conversion to the American way of doing things or ever be entirely unneeded. There will be plenty of work and opportunity in cooperative pursuits to establish more and better local units that reach with inspired pride toward perfection. The Republican party brought the national forests into being because they sensed the conditions and needs of their time. They are still that alert, and now face a new set of conditions and new needs which they will meet in a manner still in accord with the constant principle of better conservation the American way. There should be no fear of an honest look at new ways and means of marching forward. It is only a proposal to study the situation. The issue in this case does not involve conservation principles or professional differences in forestry.

H. H. STOSS

Vredenburgh, Ala.

Charles C. Deam

(1865-1953)

Charles C. Deam, former state forester of Indiana, and author of many scientific papers, bulletins, and books about the flora of Indiana, died May 28.

Born August 30, 1865, in Wells County, Indiana, Mr. Deam began the study of botany when he was told by a doctor to spend some time out of doors. During a lifetime of study, he built up the finest herbarium of Indiana flora in existance, (now the property of Indiana University), and developed his own arboretum at Bluffton.

He served as state forester from 1909 to 1913, as acting state forester from 1917 to 1913, and again as state forester from 1919 to 1928. He was the author of Indiana's classified forest tax law, which protects farmwoods from grazing and requires owners to keep their woods productive.

Reviews

Research in the Economics of Forestry.

William A. Duerr and Henry J. Vaux, editors. 475 pp. Charles Lathrop Pack Forestry Foundation, Washington 6, D. C. 1953. $6.

Research in the Economics of Forestry is an outstanding contribution to forestry literature. It represents over three man-years of professional effort on the part of the editors and three associate editors. In addition, the 67 authors and 19 advisors put in about the same amount of time.

This book is the culmination of a project started by the Charles Lathrop Park Forestry Foundation and carried out by the S.A.F. The editors, William A. Duerr and Henry J. Vaux, both trained in economics as well as forestry, acted as a Society committee to define the scope and methods of research in the economics of forestry.

Along with silviculture, protection, management, and utilization, forest economics ranks as one of the five basic fields of forestry. However, the content of forest economics has never been clarified; its function is imperfectly recognized; and research methods have not been systematized. These deficiencies are rectified by this book.

Forest economics is defined as that area of science ". . . . concerned with problems of allocating productive resources so as to maximize the returns from them, wherever the use of forest resources is involved." It emerges as a distinct discipline due to the fact that ". . . . forests have far longer production periods than those commonly encountered in other lines of economic activity. . ." and "Much standing timber can be, and is, considered alternatively as either capital plant or finished product." Also, ". . . . a substantial proportion of the values produced by the forest are not directly measured by existing markets."

The full extent of the subject is defined in this book through the presentation of 127 topic discussions dealing with representative research problems. At the same time methods are outlined for solving research problems within the field. Through a system of cross-referencing by numbered topics, repetition has been reduced to a minimum. The editors have done a magnificent job. They have written the matrix of text and many topic statements as well as organized and condensed over 2,500 pages of manuscript submitted by the well-qualified authors.

The economic process in forestry is covered in eight chapters. Chapter I deals with some of the economic forest problems of the United States and a historical account of forest-economics research; including its functions, content, and methods. Chapter II covers the forest economy at large as a part of the total economy, emphasizing the interrelations between forestry and other lines of economic activity. The third chapter coalesces material on the agents of production (including labor, capital, entrepreneurship, land use, and land tenure) and considers the relation of each to the forest economy. Chapters IV and V deal with the supplying of forest goods and services as well as harvesting and processing. Following a broad view of the market structure including prices, trends, and geographic aspects in Chapter VI, the main part of the text closes with a treatment of consumer demand, the hub of all economic activity in forestry.

Opening the book at random, one finds on page 98 the topic heading 15b. "Optimum Intensity of Protection from Forest Fires," authored by G. L. Hayes and T. F. Marburg. The following eight pages are devoted to a discussion of this problem; the purpose of study, relation to the field, definitions, principle and procedure, special considerations, gathering and treating cost and damage records, fitting of the cost-loss curve, and pertinent references. While the treatment of the other topics varies slightly, each topic in itself is complete, or if it overlaps with another topic this is noted by a cross-reference number. On page 225 is topic 42, "Methods of Evaluating Alternatives in Timber or Forage Management" by W. E. Bond and Sam Guttenberg. Turning again at random, on page 393 one finds topic 81, "Geographical Structure of Forest-Product Prices" by John A. Guthrie. These examples serve to show the wide breadth of subject matter treated in this volume.

Chapter VIII, dealing with research in forest economics within the United States from 1940 to 1950, indicates that far too little is being done in the field by nonfederal groups. Two-thirds of all studies other than graduate theses were carried out by the federal government. There is urgent need for greater research efforts by nonfederal groups who hold three-quarters of the forest land.

It is pointed out that other very important aspects of forest-economics research are also being neglected. Of the 861 studies reported during the decade, only about one percent deals with capital and entrepreneurship (as agents of production), as well as supply and demand for forest products. No doubt the lack of advanced economics training at least partially explains why so little is being done in the above-mentioned areas. Of the 452 study leaders who reported on their training, only 13 percent had major advanced training in economics. Many problems require a more thorough knowledge of economic theory and modern analytical methods than the average forester possesses.

In the field of forest economics there were 270 studies in progress during 1950, about twice the number reported in 1940. The needs for research in the field will in-

crease in the future. To attain added quantity and quality of research it will be necessary "... first to improve the technical proficiency of research personnel and the effectiveness of research procedures, and second, to sharpen the selection of projects." Training men for the field is a problem for our forestry schools. During the decade 1940-1950 only four of the active forest economists were on forestry school faculties. Since then this number has only increased slightly. Training in the past has been handled mainly by a generalist or a specialist in some other field. This needs correction.

The book is written for the technical reader, the forester and the economist. It is highly recommended to research workers in the economics of forestry and to research institutions. Graduate students looking for thesis topics and guides for developing them will find the book invaluable. It will also be helful to teachers handling courses in the field or to those wishing to integrate economics with their particular area in forestry. The book should be useful to forest managers, for many practical problems are analyzed which will be helpful in making specific decisions.

EUGENE V. ZUMWALT,
Yale School of Forestry.

Beatty's Cabin.

By Elliott S. Barker. 220 pp. Illus. University of New Mexico Press, Albuquerque, N. Mex. 1953. $4.50.

The book is the story of the upper Pecos River watershed. Beatty's cabin is in the center of this vast wilderness area. Each chapter is complete in itself under such intriguing titles as "Cabin in the Wilderness." "Forestry Comes to the Pecos High Country," "Trail Riders of the Wilderness," and "Extirpation and Restoration of Elk." Chapter 13 translates into English the meaning and background of the many romantic Spanish names.

The Pecos River Forest Preserve (now a part of the Santa Fe National Forest) was established in 1892. The book tells the story of the long history since 1892 and of the many forest officers involved in its administration during the past six decades. The author knows that story well as he rode to Beatty's cabin before 1909, was a forest ranger on the Pecos as a young man, and has traveled into all portions of the large mountain area on hundreds of occasions. For the past two decades he has administered the fish and game resources for the State of New Mexico.

The book is more than personal adventures and the long historical facts of an upper watershed and its forests, streams, and mountains. It is clear that the author loves the mountains and the physical, spiritual, and mental benefits that come from riding, hiking, and loafing in a vast wilderness far from the hurrying crowds.

The book is written in nontechnical language except for the inclusion of the Latin names for most of the trees, shrubs, and flowers. Many incidents are described in colorful western terms. Except for two or three minor printing slips, the book is well edited and printed.

C. OTTO LINDH.

One Hundred Years of Engineering Progress with Wood: Proceedings of Wood Symposium.

112 pp. Illus. Timber Engineering Company, Washington, D. C. 1952.

Unfortunately time and space do not permit individual consideration of the twenty-one papers and five discussions that are contained in this publication. The articles, all by authorities in the fields of wood engineering and utilization, attempt with remarkable success and clarity to define the role that wood as an engineering and industrial material has played in the development of this nation's civilization during the past 100 years. Wood as a structural material on land and sea, laminated wood, plywood, furniture manufacture, wood preservation and machinery development are some of the topics covered.

It is perhaps unfortunate that the proceedings failed to include any article specifically dealing with the important part played by wood in the development of the aircraft industry which has been responsible, either directly or indirectly, for so much basic research in wood properties and use. Educators will also regret that no attention has been given to the development in recent years of the specialized curricula in the colleges and universities especially pointed towards the wood engineering and utilization fields. While progress in this direction has been slow and faltering, the gains made have been sufficiently promising to warrant mention.

While the accent has in most cases been on past accomplishments, future trends and possibilities for further advancements in wood use have not been neglected. Special reference is made to the informative paper by Armin Elmindorf on the fabrication of core panels, both at home and abroad, for the furniture and allied industries, from shavings, chips and other forms of wood waste. Although wood has been displaced in some areas by competing materials, no discouraging note is sounded for the future. New uses and improved techniques in old uses will continue to require this versatile and renewable resource.

While this volume is "must" reading for all foresters, young and old, it is especially recommended to the undergraduate who too often limits his imagination in the realm of wood use to primary products. This publication should also be required reading for all college students in basic engineering and architecture whose programs of study too frequently fail to give adequate treatment to wood as an engineering and industrial material. High school guidance personnel should find this work very

helpful in their counseling activities. For continued growth and development, the wood-using and allied industries will need the services of large numbers of engineers and technologists properly trained in the properties and uses of wood. Forest products engineers and wood utilizationists welcome this publication as a worthy contribution to the literature of the field.

NEWELL A. NORTON,
The Pennsylvania State College.

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Trees and Their Story

By Dorothy Sterling. 119 pp. Illus. Doubleday & Company, Inc., New York 22. 1953. $2.50.

If prospective foresters could be introduced in childhood to dendrology and plant physiology through a book as pleasant as *Trees and Their Story*, there might be less groaning later on in the classrooms of professional schools. Relying chiefly on the picture medium, author Sterling and photographer Ehrenberg have made a delightful survey of American trees, their various functioning parts, their relation to environment, and even of some "clues for tree detectives."

In 1942, W. M. Harlow's *Trees of the Eastern United States and Canada* indicated the attractiveness of portrait photographs of buds, twigs, and tree flowers. The photographs by Myron Ehrenberg are not in color, as were Harlow's, but they confirm the earlier indication that such photography merits book-length treatment.

The book makes some attempt at instructional arrangement. A brief introduction presents the contrast of the large tree (redwood) with the small tree (dwarf pine growing in a pottery bowl). Then the text takes up roots, trunk, and leaves, according to function. Other parts of trees appear with changing seasons. Buds of hardwoods and conifers make up the winter pictures. In spring, willow catkins appear, followed by portraits of the flowers of maple, oak, ash, birch, hickory, and white pine. Summer brings the varied leaf patterns of oaks, sassafras, and sweetgum. Two particularly fine plates in this section show the fascicular arrangement of red and white pine needles. Fruits, nuts, cones, and bark illustrate autumn. Other outstanding photographs show six kinds of leaf scars.

Silviculturists who make photography a part of their work, or who pursue it as a hobby, can take heart from this fine series of pictures. Many problems of lighting and focus, which make forest photography a discouraging business, seem to have been surmounted by Mr. Ehrenberg. Just how he surmounted them, this reviewer cannot say, but she congratulates him on his flattering portraits of those trees which American foresters are pleased to regard both as friends and as a means of livelihood.

FRANCES J. FLICK

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Wildlife Management.

By Durward L. Allen. 95 pp. Illus. Merit Badge Series, Boy Scouts of America, 2 Park Avenue, New York 16, N. Y. $0.25.

It is generally agreed that the proper training of youth is the soundest investment for the future. It is generally recognized that tools for such training are inadequate and sometimes lacking. This situation, nationally, adds up as a threat to one of the nation's greatest responsibilities.

Against this need-for-action background, Dr. Allen, in the booklet reviewed here, has contributed in appreciable measure to the sound training of youth in the important fields of soil, water, and wildlife management.

Casual leafing of this work—one of the latest in the imposing Merit Badge Series of the Boy Scouts of America—discloses it to be a generalized guide to wildlife management. More careful examination convinces one that the simplification is a job well done. Anchored to sound biological and ecological principles, and treating the complex interrelationship of animals, plants, land, water, nature, and man in a style eminently suited to Boy Scouts, *Wildlife Management* is, indeed, reading for anyone concerned with the faunistic aspects of natural resources management.

For its modern and authoritative viewpoint, the reviewer can recommend this booklet as good reading even for game and fish administrators and technicians. Its greatest value arises from its soundness of concept regarding production: soil and water fertility and carrying capacity; and the relationship of these basics of the environment to population density, surpluses, and turnover. Other concepts, equally basic, consider plant and animal successions, food chains, predator control, and predator-prey relationships, all in keeping with the most advanced understanding of these phenomena.

The author confines the mechanics of wildlife management largely to habitat improvement, to which two chapters, about equally divided between agricultural and forestry interests, are devoted. The chapter, "Managing Woodlands for Wildlife," is of decided farm-forestry interest in view of Dr. Allen's discussions of release cuttings, brushpiles, den trees, and food trees, wherein he describes wildlife's needs, and suggests how woodland management can be oriented to meet them. All such discussions are based on plant succession, affected chiefly through cuttings designed to ". . . create the maximum of edge . . . and . . . maximum numbers and kinds of wildlife."

Careful consideration of this work leaves no doubt of its superb adaptation to the purposes intended. It goes far to alleviate worries one may have concerning the training of Boy Scouts along conservation lines. No greater claim to worth could be given.

LEE E. YEAGER.

The best augury of a man's success in his profession is that he thinks it the finest in the world.

GEORGE ELIOT

Current Literature

Compiled by MARTHA MEELIG, *Librarian, State University of New York College of Forestry*

Range Management Section Compiled by FRANCES FLICK, *Library, U. S. Department of Agriculture*

General

Five Years in British Columbia's Forestry World; An Address by Lowell Besley. 16 pp. Canadian Forestry Ass'n., Vancouver, B. C. 1953. Forest Conservation Lecture Series.

Forestry as a Career; Opportunities in a Growing Profession. 15 pp. Illus. Duke University School of Forestry, Durham, N. C.

Growing Christmas Trees in Pennsylvania. By W. W. Simonds. 22 pp. Illus. Pennsylvania State College, State College. 1953. Cir. No. 415.

The Petawawa Forest Experiment Station. 27 pp. Canada Dept. of Resources and Development, Ottawa. 1952. For. Research Div. Misc. Publ. No. 3.

Pocket Check List of Timber Trees. By J. Wyatt-Smith. 171 pp. Malaya Conservator of Forests. Printed by Caxton Press, Ltd., Kuala Lumpur. 1952. Malayan Forest Records No. 17.

Raising Christmas Trees for Profit. By Knut Lunnum. 20 pp. illus. Extension Services of State College of Washington; Oregon State College; University of Idaho. 1953. Pacific Northwest Cooperative Extension Publ. No. 6.

Waipoua Kauri Forest. 12 pp. Illus. New Zealand Forest Serv., Wellington. 1953. Information Series No. 14.

Conservation

Water, Woods, Wildlife, Wisconsin. By J. W. Clark. 32 pp. Illus. State Soil Conservation Committee, Madison. 1953. Cir. No. 417.

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Society Affairs

Officers and Members of the Council, 1952-1953

GEORGE L. DRAKE, *President*
Simpson Logging Company
Shelton, Wash.

WILLIAM J. BROWN
Woodlands Department
Kimberly-Clark Corporation
Neenah, Wis.

D. B. DEMERITT
Dead River Company
6 State Street
Bangor, Me.

FRANK H. KAUFERT
School of Forestry
University of Minnesota
St. Paul 1, Minn.

ELWOOD L. DEMMON, *Vice President*
Southeastern Forest Experiment Station, Federal Building
Asheville, N. C.

C. OTTO LINDH
U. S. Forest Service
P. O. Box 1310
Albuquerque, N. M.

GORDON D. MARCKWORTH
College of Forestry
University of Washington
Seattle 5, Wash.

RICHARD E. MCARDLE
Forest Service
U. S. Department of Agriculture
Washington 25, D. C.

HENRY CLEPPER, *Executive Secretary*
Mills Building, 17th Street at Pennsylvania Avenue, N. W.
Washington 6, D. C.

EARL PORTER
Southern Kraft Division
International Paper Company
Mobile 9, Ala.

PERRY A. THOMPSON
12 Elkin Court
San Rafael, Calif.

RUTHFORD H. WESTVELD
Department of Forestry
University of Missouri
Columbia, Mo.

Annual Meeting

Society of American Foresters

Colorado Springs, Colo., September 14-17, 1953

Theme: "Nature on Edge"

Schedule of Events

Those expecting to attend the meeting are urged to arrive in Colorado Springs on Sunday, September 13, or not later than the morning of Monday, September 14. The open meetings start on Monday morning.

As will be seen from the following schedule of events, there will be numerous meetings and sessions arranged so as to provide attractions for a diversity of interests.

Saturday, September 12

Council of Forestry School Executives, all-day (executive) meeting.

Sunday, September 13

S.A.F. Council, morning and afternoon meeting.

JOURNAL OF FORESTRY Editorial Board, evening conference.

Committee on Accrediting, evening conference.

Joint meeting of the Council and Section Delegates, evening.

Xi Sigma Pi biennial convention, evening. The meeting will be open to active or alumni members of the fraternity.

Monday, September 14

Division of Education, morning and afternoon sessions.

Division of Silviculture, morning and afternoon sessions.

Divisions of Private Forestry and Forest Products, joint morning and afternoon sessions.

Division of Public Relations, evening session.

Division of Economics and Policy, evening session.

Association of Consulting Foresters, evening meeting.

Tuesday, September 15

General meeting, morning.

Society Affairs session, afternoon.

Chuck Wagon Dinner at the Garden of the Gods, evening.

Wednesday, September 16

Division of Forest Management, morning and afternoon sessions.

Divisions of Watershed Management and Range Management, joint morning and afternoon sessions.

Division of Recreation and Wildlife Management, joint morning and afternoon sessions.

Annual Society dinner, evening.

Thursday, September 17

Choice of three guided field trips.

Ladies' Activities

Ladies are cordially invited. There will be a special reception room available to the ladies throughout the meeting, and an early get-acquainted tea has been planned. In addition several delightful auto trips have been arranged to scenic and historic places of interest in the Pikes Peak region.

Ladies are especially invited to the Chuck Wagon dinner in the Garden of the Gods on September 15 (sports wear *de rigueur*), and to the annual Society dinner on September 16 (informal attire suitable).

Division Meetings

Division of Education

Monday, September 14

G. B. Hartman, Chairman
K. P. Davis, Vice Chairman
A. E. Wackerman, Secretary

Morning Session

Panel Discussion: "Effective Teaching." Moderator: Archie E. Patterson, School of Forestry, University of Georgia, Athens, Ga.

1. "Essentials of Effective Instruction." Walter F. McCulloch, School of Forestry, Oregon State College, Corvallis, Ore.

2. "Effective Use of Laboratory and Field Trip Time." Myron Krueger, School of Forestry, University of California, Berkeley, Calif.

3. "Use of Tests and Examinations as a Teaching Tool." Frank Kaufert, School of Forestry, University of Minnesota, St. Paul, Minn.

4. "Methods of Teacher Self-Improvement." George W. Thomson, Department of Forestry, Iowa State College, Ames, Iowa.

5. Business Meeting.

Afternoon Session

1. Report of Committee appointed to study the need for a proposed Journal of Forest Science. Chairman, Stephen Spurr, Department of Forestry, School of Natural Resources, University of Michigan, Ann Arbor, Mich.

2. Panel Discussion: "Better Forestry Apprenticeship." Moderator: Ross Williams, School of Forestry, Montana State University, Missoula, Mont.

"Study-Work Arrangements."

"Practical Work While in College."

"Increased Effectiveness in Teaching Major Professional Courses when Students have had a Reasonable Amount of Practical Training."

"Value of 'On-the-Job' Training Prior to Graduation."

"Post Graduate Training and Indoctrination."

Industry:

Public Agencies:

3. "What Employers Expect of Forestry School Graduates." William C. Finley, American Walnut Manufacturers Association, Chicago, Ill.

Division of Silviculture

Monday, September 14

Russell K. LeBarron, Chairman
Philip A. Briegleb, Vice Chairman
Jesse H. Buell, Secretary

Morning Session

1. "Thinning of Young Douglas-fir in Western Washington." Philip G. Haddock, College of Forestry, University of Washington, Seattle, Wash. and Svend O. Heiberg, College of Forestry, State University of New York, Syracuse, N. Y.

2. "Silvicultural Foundations for National Forest Cutting Practice in the Ponderosa Pine Stands of the Southwest." James A. Egan, U. S. Forest Service, Albuquerque, N. Mex.

3. "Blow-up Fires—Silviculture or Weather Problems?" Keith Arnold, School of Forestry, University of California, and C. C. Buck, California Forest and Range Experiment Station, Berkeley, Calif.

4. "Some Silvicultural Problems in Growing Shelterbelts on the Northern Great Plains." E. J. George, Bureau of Plant Industry, Soils and Agricultural Engineering, U. S. Department of Agriculture, Mandan, N. Dak.

5. "The Role of Natural Control Factors in the Engelmann Spruce Beetle Outbreak in Colorado." Noel G. Wygant, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Fort Collins, Colo.

Afternoon Session

Panel Discussion: "The Role of Genetics in Silviculture." Moderator: George M. Jemison, Northern Rocky Mountain Forest and Range Experiment Station, Missoula, Mont.

1. "The Scope of Forest Genetics." Scott S. Pauley, Maria Moors Cabot Foundation for Botanical Research, Harvard University, Petersham, Mass.

2. "Extensive Application of Genetics by the Silviculturist." Clemens M. Kaufman, School of Forestry, University of Florida, Gainesville, Fla.

3. "Selection in the Intensive Phase of Forest Tree Improvement." Bruce Zobel, Texas Forest Service, College Station, Texas.

4. "Importance of Hybridization in Forest Tree Improvement." J. W. Duffield, Institute of Forest Genetics, U. S. Forest Service, Placerville, Calif.

5. "Opportunities in Disease and Insect Control Through Genetics." A. J. Riker, College of Agriculture, University of Wisconsin, Madison, Wis.

6. General discussion by panel.

7. Open discussion by members.

Joint Meeting

Monday, September 14

Division of Private Forestry

E. F. Heacox, Program Chairman
Julian McGowin, Vice Chairman
N. T. Barron, Secretary

Division of Forest Products

Fred E. Dickinson, Chairman
R. C. Fraunberger, Vice Chairman
Lincoln A. Mueller, Secretary

Morning Session

Theme: Evaluation of Forest Management Practices.

Speakers: W. S. Swingler, Branch of State and Private Forestry, U. S. Forest Service, Washington, D. C.

W. D. Hagenstein, Industrial Forestry Association, Portland, Ore.

"Chemical Debarking." Hugh Wilcox, State University of New York, College of Forestry, Syracuse, N. Y.

Afternoon Session

Business meeting; election of officers for 1954.

Theme: Trends and Possibilities in Forest Products Utilization in the Rocky Mountain Territory.

1. "The Swedish Gang Sawmill for Rocky Mountain Woods." Larry O'Neil, Forest Products Company, Kalispell, Mont.

2. "The Use of Rocky Mountain Species for Pulping." H. E. Troxell, School of Forestry and Range Management, Colorado A & M College, Fort Collins, Colo.

3. "Suitability of Rocky Mountain Species for Veneer and Plywood." I. V. Anderson, Forest Utilization Service, U. S. Forest Service, Missoula, Mont.

4. "Hardboard Manufacturing Possibilities for the Rocky Mountain Territory." John B. Grantham, Oregon Forest Products Laboratory, Corvallis, Ore.

5. "Salvaging Lumber Shorts by End Jointing." Boyd D. Richards, Department of Forestry, Alabama Polytechnic Institute, Auburn, Ala.

Division of Public Relations

Monday, September 14

Albert Arnst, Chairman
Ralph Unger, Vice Chairman
C. W. Mattison, Secretary

Evening Session

1. "Public Relations Problems of Public Land Administrators in the Rocky Mountain Region." Joseph N. Hessel, Division of Information and Education, U. S. Forest Service, Denver, Colo.

2. "Public Relations Problems of Public Land Users in the Rocky Mountain Region." Willard Simms, *The Record Stockman*, Denver, Colo.

3. Motion picture: "The Enemy Is Fire," produced by Oregon and Washington Forest Fire Associations.

Division of Forest Economics and Policy

Monday, September 14

E. V. Zumwalt, Chairman
John Zivnuska, Vice Chairman
William A. Duerr, Secretary

Evening Session

Theme: "Economics of Spruce-

Beetle Control in the Rocky Mountains."

1. "Technology of the Problem." B. H. Wilford, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Fort Collins, Colo.

2. "Control and Salvage Policy." Arthur L. Nelson, U. S. Forest Service, Denver, Colo.

3. "Economic Interpretation." Henry J. Vaux, School of Forestry, University of California, Berkeley, Calif.

4. Business Meeting.

General Meeting

Tuesday, September 15

Harry R. Woodward, Chairman

Morning Session

1. "Public Relations Problems in the Central Rocky Mountains." John W. Spencer, Santa Rosa, Calif. (Former regional forester, U. S. Forest Service, Denver, Colo.)

2. "Problems Facing Forest Management in the Central Rocky Mountains." Jesse H. Buell, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.

3. "Watershed and Range in the Central Rocky Mountains." Harold G. Wilm, Division of Forest Influences, U. S. Forest Service, Washington, D. C.

4. "Protection Problems in the Central Rocky Mountains." Noel D. Wygant, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Fort Collins, Colo.

5. "Recreation and Wildlife Problems in the Central Rocky Mountains." J. V. K. Wagar, School of Forestry and Range Management, Colorado A & M College, Fort Collins, Colo.

Discussion.

Society Affairs

Tuesday, September 15

Geo. L. Drake, President
E. L. Demmon, Vice President

Afternoon Session

Report of the President, Geo. L. Drake.

Report of the Executive Secretary, Henry Clepper.

Report of the Editor, Arthur B. Meyer.

Report of Committee on Accrediting, Myron Krueger, Chairman.

Report of Council Committee on Membership, Frank H. Kaufert, Chairman.

Report of Committee on International Relations, Tom Gill, Chairman.

Report of Committee on Safety, Seth Jackson, Chairman.

Report of Committee on Civil Service, M. K. Goddard, Chairman.

Report of Committee on Forest Types, F. H. Eyre, Chairman.

Report of Committee on *The Foresters' Manual*, E. W. Littlefield, Chairman.

Open forum discussion.

Chuck Wagon Dinner

Tuesday, September 15

Garden of the Gods

An outdoor dinner and evening of entertainment, western style, put on by the Colorado Springs Junior Chamber of Commerce.

Division of Forest Management

Wednesday, September 16

DeWitt Nelson, Chairman
Gordon D. Fox, Vice Chairman
Stephen N. Spurr, Secretary

Morning Session

Photography and Mensuration

1. "The Control Method of Forest Management in an Age of Aerial Photography." Ashbel F. Hough, Northeastern Forest Experiment Station, Upper Darby, Pa.

2. "Use of Aerial Surveys in Forest Management." Kendall B. Wood, K. B. Wood and Associates, Inc., Portland, Ore.

Discussion leader: Herbert Jensen, Hammon, Jensen and Wallen, Consulting Foresters, Oakland, Calif.

3. "The Continuous Inventory of Ponderosa Stands in the Southwest." Dean Cutler, U. S. Forest Service, Albuquerque, N. Mex.

4. "Simplified Computation of Volume and Growth." Stephen H. Spurr, School of Natural Resources, University of Michigan, Ann Arbor, Mich.

Afternoon Session

Forest Administration

1. "The Administrative Aspects of Forest Management." Earl W. Loveridge, U. S. Forest Service, Washington, D. C.

2. "Administrative Management of a Large State Forestry Department." B. L. Orell, Division of Forestry, State Department of Conservation and Development, Olympia, Wash.

Discussion leader: DeWitt Nelson, Division of Forestry, State Department of Natural Resources, Sacramento, Calif.

Forest Protection

1. "Maintaining an Effective Organization to Control the Occasional Large Fire." Mayhew Davis, U. S. Forest Service, Albuquerque, N. Mex.

2. "The Significance of Weather Modification to a Forester." A. A. Brown, Division of Fire Research, U. S. Forest Service, Washington, D. C.

3. "Lightning Fire Research in the Northern Rocky Mountains." Jack S. Barrows, Northern Rocky Mountain Forest and Range Experiment Station, Missoula, Mont.

4. "The Use of Trap Logs in the Control of Engelmann Spruce Beetle." Roy H. Nagel, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, Fort Collins, Colo.

5. "Harvesting of Beetle-Killed Engelmann Spruce." Walter H. Schaeffer, College of Forestry, University of Washington, Seattle, Wash.

Joint Meeting

Wednesday, September 16

Division of Watershed Management

H. G. Wilm, Chairman
Marvin D. Hoover, Vice Chairman
Robert E. Dils, Secretary

Division of Range Management

Raymond Price, Chairman
M. W. Talbot, Vice Chairman
Grant A. Harris, Secretary

Morning Session

1. Introductory remarks by chairman of Division of Watershed Management.

2. "An Evaluation of the Effect of Watershed Treatment on Flood Runoff in the New England-New York River Basin Area." Norman R. Tripp and D. E. Whelan, both of Northeastern Forest Experiment Station, Upper Darby, Pa.

3. "Soil Moisture Trends under Old Field and Forest Cover in the Hill Section of Southern Illinois." William R. Boggess, University of Illinois, Robbs, Ill.

4. "Changes in Streamflow Characteristics Brought About by Cutting Forest Vegetation." E. A. Johnson, Southeastern Forest Experiment Station, Asheville, N. C.

5. "Effects of the Forest Floor on the Disposition of Rainfall in Pine Stands." P. B. Rowe, California Forest and Range Experiment Station, Berkeley, Calif.

Afternoon Session

1. Introductory remarks by chairman of Division of Range Management.

2. "Range Condition as Defined by Forage Production and Watershed Values." E. H. Reid, Forest Service, U. S. Department of Agriculture, Washington, D. C.

3. "Recent Developments in California Range Management." M. W. Talbot, California Forest and Range Experiment Station, Berkeley, Calif.

4. "Condition and Trend of Mountain Rangeland as Affected by Erosion." Lincoln Ellison, Intermountain Forest and Range Experiment Station, Ogden, Utah.

5. "Surface Runoff and Erosion from Pine Grasslands of the Colorado Front Range." E. G. Dunford, Pacific Northwest Forest and Range Experiment Station, Portland, Ore.

6. "Range Management in the Southwest." Walter L. Graves, U. S. Forest Service, Taos, N. Mex., and C. E. McDuff, U. S. Forest Service, Albuquerque, N. Mex.

7. "Evaluation of Range-Watershed Conditions of Mountain Grasslands in Western Colorado." E. J. Dortignac, Southwestern Forest and Range Experiment Station, Tucson, Ariz., and G. T. Turner, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colo.

Joint Meeting

Wednesday, September 16

Division of Forest Recreation

C. Frank Brockman, Chairman
Harthon L. Bill, Vice Chairman
William N. Parke, Secretary

Division of Forest-Wildlife Management

Ernest Swift, Chairman
J. V. K. Wagar, Vice Chairman
Galen Pike, Secretary

Morning Session

1. "Recreational Activities and Their Coordination with Other Forest Values on the Pike National Forest." Raymond E. Phillips, Pike National Forest, Colorado Springs, Colo.

2. "Recreational Activities—A Potent Public Relations Force in Forestry." Albert Arnst, *The Timberman*, Portland, Ore.

3. "Interpretation as a Means of Developing Public Responsibility for the Care of Public Lands." Edwin C. Alberts, Rocky Mountain National Park, Estes Park, Colo.

4. "Problems of Winter Use on Forest Lands." Felix C. Koziol, Wasatch National Forest, Salt Lake City, Utah.

Afternoon Session

1. "Wildlife Management in Relation to Multiple Use." Ralph R. Hill, U. S. Forest Service, Denver, Colo.

Discussion leader: Ralph E. Crowell, Mark Twain National Forest, Springfield, Mo.

2. "The Problems of Supervised Hunting on Public Lands." George H. Kelker, School of Forest, Range and Wildlife Management, Utah State Agricultural College, Logan, Utah.

Discussion leader: Gilbert N. Hunter, Colorado Game and Fish Commission, Denver, Colo.

3. "Wildlife Values in Western Wilderness Area Management." James P. Gilligan, University of Michigan, Ann Arbor, Mich.

4. "Management of Black Hills Deer." Lester M. Berner, Department of Game, Fish and Parks, Pierre, S. Dak.

5. Division business meeting.

Society Dinner

Wednesday, September 16

William G. Meginnies, Toastmaster.

Address, J. D. Pender, attorney and conservationist, Denver, Colo.

Entertainment. The Pejn Indian dancers in a program of traditional dances of the Plains Indians in authentic costume; and Bob Cook's exhibition square dance set in a demonstration of typical Western pioneer American dances.

Field Trips

Thursday, September 17

A choice will be offered of three guided field trips to places of interest in the nearby Rocky Mountain area. Transportation by bus will be available at moderate cost. Lunches will be served enroute.

Monument Nursery

Trip number 1 to the Monument Nursery. Cost, $2 including transportation and luncheon. Leave 10 a.m.; return 3 p.m. Round-trip distance, 40 miles.

The Monument Nursery, operated by the U. S. Forest Service, is 20 miles north of Colorado Springs. Seeding was started in 1907. Production is 1½ to 2½ million trees annually of Douglas-fir, ponderosa pine, Engelmann spruce, and lodgepole pine. Total production has been 60 million trees, both seedlings and transplants. The output is used for reforestation on the national forests of the Rocky Mountain and Black Hills regions.

Manitou Experimental Forest and Range

Trip number 2 to the Manitou Experimental Forest and Range. Cost, $2 including transportation and luncheon. Leave 9 a.m.; return 4:30 p.m. Round-trip distance 60 miles.

This research center, 28 miles northwest of Colorado Springs, is a unit of the Rocky Mountain Forest and Range Experiment Station. Its area is 26 square miles and is representative of the soil and vegetation of the Front Range.

It was established in 1936 to study problems of land use in relation to the management of all resources of the Front Range. Research is centered around range management, artificial revegetation, and watershed management. Foresters and range managers will see research work in progress on grasses, methods of stocking, types of range conditions, measurement of precipitation, and the relation of vegetative cover to accelerated runoff and erosion.

Gold Camp Road

Trip number 3 to Cripple Creek. Cost, $2.50 including transportation and luncheon. Leave 8:30 a.m.; return 5 p.m. Round-trip distance, 100 miles.

This trip is one of unusual scenic and historical interest. The route is over the famous Gold Camp Road, constructed on the road bed of the old Colorado Springs-Cripple Creek Railroad, which winds through tunnels and over the mountains to the mining camp of Cripple Creek and to Victor. The return will be by way of Gillette and Divide, thence down Ute Pass.

The party taking this tour will encircle Pike's Peak, and will have splendid views of the plains and the Sangre de Cristo Mountains to the South and West.

Other Trips Available

In addition to the foregoing guided trips, opportunities will be available for numerous individual tours to places of regional interest. The summit of

_____, 1953

Hotel Reservations Committee,
Society of American Foresters,
c/o Chamber of Commerce,
Colorado Springs, Colorado.

Please make a reservation for the following room accommodations for arrival on September _____ a.m. p.m. Departure date, September _____.

I understand that accommodations will be provided at the daily rate specified, if available; otherwise the next nearest rate will apply.

_____ Single room with bath. Rate $ _____.

_____ Double-bed room with bath. Rate $ _____.

_____ Twin-bed room with bath. Rate $ _____.

_____ Suite (parlor, twin-bed room, and bath). Rate $ _____.

_____ Other (specify accommodations desired).

_____. Rate $ _____.

First choice hotel _____.

Second choice hotel _____.

Motel or tourist court (specify accommodations desired).

_____. Rate $ _____.

The above room accommodations are requested for the following persons, in addition to myself. (Print or type names and addresses legibly.)

My name: _____

Street address: _____

City, zone, state: _____

Pike's Peak can be reached by automobile or by cog railroad. An incline-railroad runs up the east slope of the peak.

An interesting trip over mountain roads with many scenic attractions may be made to Devil's Head Mountain where the Pike National Forest maintains a lookout station.

Several good highways traverse the Pike National Forest. U. S. 24 from Colorado Springs through South Park to Buena Vista crosses the south end of the forest. U. S. 285 from Denver to Antero Junction crosses the northern portion. At Lake George on U. S. 24 two side trips may be made: one to the Eleven-mile Canyon recreational area and reservoir, a water storage area for Denver; and the other up Tarryall Creek to Jefferson.

The silviculturist and forest manager will find the Fraser Experimental Forest of unusual interest. It is near Fraser, Colo., in the high country on the Arapaho National Forest west of Denver. From Fraser, the trip may be continued to Grand Lake and across the Trail Ridge Road into famous Rocky Mountain National Park, from which one may return south to Denver or north to Fort Collins, site of Colorado A & M College School of Forestry and Range Management and headquarters for the Rocky Mountain Forest and Range Experiment Station.

These suggested individual trips do not exhaust the number available. Many shorter sight-seeing tours may be taken in the vicinity of Colorado Springs, and representatives of local agencies will be on hand to assist those desiring them.

Transportation

Colorado Springs is easily accessible by airlines, railroads, and highways.

The airlines are Braniff, Continental, and Monarch.

The railroads are Chicago, Rock Island and Pacific; Atchison, Topeka and Santa Fe; Denver, Rio Grande & Western; Colorado and Southern (Burlington); and Missouri Pacific.

Three U. S. Highways pass through the city—U. S. 85-87, north and south; and U. S. 24, east and west.

Hotel Reservations

A special Society committee will handle requests for hotel reservations, which will be filled in the order received. This committee cannot be responsible for failure to obtain rooms by those making reservations direct with hotels.

The reservation coupon is for your convenience in requesting hotel rooms. Please send your request to the committee to avoid delay and confusion. Room assignments will be made promptly, and you will receive a confirmation in two weeks or less. Anyone desiring to make a reservation without tearing a page from the JOURNAL may do so simply by supplying the necessary information in a letter addressed to the committee.

The Antlers Hotel is the headquarters for the meeting. But since the Antlers cannot accommodate everyone, other hotels and motels in the city will cooperate in housing members.

There follows a list of hotels available for this meeting and their daily rates. All except the Broadmoor are within five minutes' walking time of the City Auditorium where most of the sessions will be held. All rates listed are European plan (without meals).

In addition there are numerous good motels and tourist lodges within two to five miles of City Auditorium. Those who will have their own automobile transportation will find these motels quite convenient and somewhat less expensive than the city hotels.

Hotels

All hotels listed are within five minutes' walking time of City Auditorium, except the Broadmoor, which is 4½ miles. Daily room rates with bath (European plan, without meals) are shown.

Antlers Hotel, Cascade and Pikes Peak Avenues, the headquarters hotel for the meeting. Single rooms, $7 to $9. Double and twin-bed rooms, $9 to $11. Suites, $12 to $20.

Alta Vista Hotel, 118 North Cascade Avenue. Single rooms, $4 to $6. Double and twin-bed rooms, $6 to $9.

Broadmoor Hotel (4½ miles to City Auditorium). Single rooms, $10. Double and twin-bed rooms, $15.

Acacia Hotel, 104 East Platte Avenue. Single rooms, $4.50 to $6. Double and twin-bed rooms, $7 to $9.

The Alamo Hotel, 126 South Tejon Street. Single rooms, $4 to $6. Double and twin-bed rooms, $6 to $14.

Joyce Hotel, 10 South Weber Street. Single rooms, $6. Double rooms, $8. Twin-bed rooms, $10 to $12. Double rooms with connecting bath, $5 and $6.

Motels and Tourist Courts

The Hotel Reservations Committee has listed 60 motels and tourist courts in Colorado Springs and Manitou Springs, all within two to five miles of City Auditorium.

Daily rates range from $3.50 to $10 for one or two persons; $5 to $15 for three or four persons; and $8.50 to $20 for four to six persons.

Members, who request reservations from tourist courts, will receive, with their confirmation of the reservation, a notice to send an advance payment for one day. This is necessary to hold the reservation.

Program Committee

The chairman of the committee in charge of the program for the meeting is J. V. K. Wagar, School of Forestry and Range Management, Colorado A & M College, Ft. Collins, Colo.

The other members of the committee are David H. Canfield, T. J. Fillas, W. G. McGinnies, and Harry R. Woodward.

Arrangements Committee

The chairman of the Committee on Arrangements is Raymond E. Phillips, U. S. Forest Service, Colorado Springs, Colo.

Assisting Mr. Phillips and heading up special task committees are the following:

Information and Publicity, J. N. Hessel.

Registration, R. B. McKennan.

Reception and Welcome, David S. Nordwall.

Society Dinner, Henry M. Shank.

Chuck Wagon Dinner, Ralph R. Hill.

Hotel Reservations, Elmer R. Miller.

Exhibits, Clinton H. Wasser.

Projection and Amplifying, David H. Canfield.

Meeting Rooms, Jacob Roeser, Jr.

Field Trips, Everett Lee.

Ladies' Activities, Mrs. R. E. Phillips.

Puget Sound Section Meets with C.I.F.

More than 100 members of the C.I.F. and the Puget Sound Section of the S.A.F. participated in a joint field trip in British Columbia, May 1 and 2.

The men gathered at Green Timbers Nursery and Ranger School a few miles outside of New Westminster, B.C., for lunch on Friday and devoted the afternoon to inspection of the nursery and its facilities and the ranger school, which is used for short term residence instruction for B.C. Forest Service men who will have charge of districts.

After dinner at the 9,600 acre University Research Forest east of Vancouver, the foresters heard papers by both Canadian and American members and an informal discussion by Tore Arnborg, a visiting Swedish forester from the University of Uppsala, about experiments in genetics to develop better tree types.

On Saturday, groups headed by University of British Columbia faculty members toured selected areas of the University Forest, following which the party visited logging operations of the Canadian Forest Products, Ltd. in the Chehalis Valley.

Columbia River Section Meeting

The Portland chapter was host to members of the Columbia River Section, S.A.F., April 17-18 at the annual meeting and banquet.

Martin L. Syverson was program chairman, and activities arranged by his committee included a tour of the 5,000 acre Portland Forest-Park, with special notice of the 1952 burn which is being reclaimed through the efforts of school children and youth groups.

Lyle F. Watts, former chief of the Forest Service spoke on "Youth and Forestry," at the annual banquet. President George L. Drake spoke on "Our Society" at the afternoon meeting, April 18.

Ozark Section Summer Meeting

A two-day field meeting of the Ozark Section was held on land of the University of Missouri, the Clark National Forest, and in the Mingo Swamp area, all in the neighborhood of Poplar Bluff, Missouri, June 5 and 6, with 80 members of the Section in attendance.

A tour in Mingo Swamp dealt with the development there of both a waterfowl refuge and a shooting area by the U. S. Fish and Wildlife Service and the Missouri Conservation Commission. Oak wilt was studied and discussed on a field trip through the University Forest and at an evening session which included the showing of an industry-financed film on that subject. Between field trip and movie 70 pounds of barbecued pork and beef and 10

pounds of fresh croppie were consumed.

On the last day the group was conducted through a portion of the Clark National Forest by Ranger Paul Kihlmire in an inspection of timber sale areas. Following this, the scene of a 5,400 acre fire of last October was visited. This incendiary fire was part of a 20,000 acre conflagration outside the national forest boundary. The unusual atmospheric conditions which largely contributed to the size of the fire—after it had been almost under control at 400 acres—were discussed.

Considerable interest was displayed by Section members in a piece of fire line construction equipment being developed by J. M. Nichols, resident forester on the University Forest. The equipment utilizes an ensilage blower, mounted behind a tractor with bulldozer attachment. It blows leaves and brush from a 6-foot line and can progress at the rate of one mile per hour, followed by one man with broom-rake and backfiring torch. The rig holds considerable promise for rocky, dry Ozark conditions.

P. W. FLETCHER,
Section Chairman.

Inland Empire Section Spring Meeting

The spring meeting of the Inland Empire Section was held April 25 in Moscow, Idaho. George L. Drake, Society president, was guest of the section and spoke on the subject of "Forty Years of Progress."

The meeting was held in conjunction with the Association of Western Forestry Clubs. Representatives from seven western forestry schools presented a panel on "The Graduate's Position in the Future in the Forestry Profession."

Fifth Call for Council Nominations

All voting members are hereby notified that the regular biennial election will be held December 5, 1953. A president, vice president, and nine other members of the Council will be elected for the two-year term 1954-1955.

The present Council is listed in the box on page 588. Any or all of these incumbents may be renominated, provided they accept the nomination in writing.

President Drake has announced that he will not be a candidate for reelection.

Membership on the Council is restricted by the Constitution to Members (formerly Senior Members) and Fellows. Any Member or Fellow is eligible to hold office who is in good standing and who accepts the nomination in writing and declares his willingness to serve if elected.

Each voter will have an opportunity to ballot on all candidates for office. Council members are elected in accordance with the system of proportional representation. The procedure of proportional representation will be explained in a later issue of the JOURNAL. It is the system by which the Society has been electing Council members for two decades. Candidates for the office of president are voted on separately; the candidate who receives the highest vote is declared elected president, and the candidate who receives the next highest vote is declared elected vice president.

How Nominations Are Made

The Constitution (Article VIII, Section 2) states the conditions under which nominations are made by petition.

1. Each petition shall name but one candidate.
2. All candidates must be eligible to hold elective office.
3. A petition shall bear the signatures of at least ten voting members who at the time of signing the petition are eligible to vote in the coming election. (Eligible voting members are Junior Members, Members, and Fellows in good standing.)
4. A voting member may not sign more than one nominating petition for President or more than one nominating petition for a member of the Council. That is, he may sign two, but no more.
5. Petitions must be in the Society office by October 2, 1953.

The Society has no special form for submitting nominating petitions. They may be written as follows:

We, the undersigned voting members of the Society of American Foresters, hereby nominate John Doe, a Member (or Fellow), for the office of president (or member of the Council) for the two-year term 1954-1955.

All nominating petitions should be sent promptly to the Society office. The executive secretary will gladly provide information about nominating or election procedure.

Nominations Received

On the day this issue went to press the following nominations had been received.

For President: Walter J. Damtoft, Canton, N. C. (Council member, 1944-1947.)

E. L. Demmon, Asheville, N. C., (Vice president, 1952-1953.)

Gordon D. Marckworth, Seattle, Wash. (Council member, 1950-1953.)

DeWitt Nelson, Sacramento, Calif. (Council member, 1948-1951.)

For the Council: William J. Brown, Neenah, Wis. (Council member, 1952-1953.)

W. C. Hammerle, New Orleans, La.

D. B. Demeritt, Bangor, Maine. (Council member, 1950-1953.)

Stanley G. Fontanna, Ann Arbor, Mich. (Council member, 1950-1951.)

Verne L. Harper, Washington, D. C.

E. F. Heacox, Tacoma, Wash.

P. D. Hanson, Missoula, Mont.

D. E. Hess, Gettysburg, Pa.

R. Vance Miles, Jr., Tuscaloosa, Ala.

Galen W. Pike, Duluth, Minn.

Carl A. Rishell, Washington, D. C.

J. Nelson Spaeth, Urbana, Ill.

John W. Squires, Jackson, Miss.

T. D. Stevens, East Lansing, Mich.

J. Herbert Stone, Portland, Ore.

Charles L. Tebbe, Philadelphia, Pa.

J. V. K. Wagar, Fort Collins, Colo.

R. H. Westveld, Columbia, Mo. (Council member, 1952-1953.)

Edwin G. Wiesehuegel, Norris, Tenn.

The Nominating Committee will make no nominations of its own unless the voting membership fails to make the required minimum number of nominations by petition. Voting members should accordingly get busy and make their own nominations.

HAROLD B. SHEPARD, *Chairman,*
Nominating Committee.

Nominations for Grade of Fellow Now Open

All Members (formerly Senior Members) and Fellows of the Society are hereby advised that nominations for the grade of Fellow are now open. The election of Fellows will be held at the time of the Society's regular biennial election, December 5, 1953.

As defined by the Constitution (Article III, Section 6), "Fellows shall be foresters of outstanding achieve-

ment as leaders in responsible directive or distinctive individual work of a fruitful character. They shall be elected from the Members and shall be engaged in forestry work at the time of their election."

Nominations by Petition

The procedure for placing Members in nomination for the grade of Fellow is by petition. The Society has no printed form for this purpose; the petition may be typewritten thus:

We, the undersigned Members and Fellows of the Society of American Foresters, hereby nominate ———— for election to the grade of Fellow in 1953.

Remember these simple rules:

1. A petition may not name more than one candidate.

2. It must be signed by 25 Members or Fellows in good standing.

3. It should be accompanied by a factual, not eulogistic, biographical sketch of at least 200 words giving an account of the nominee's professional career and accomplishments.

4. It must be received in the executive office of the Society in Washington, D. C., not later than October 2, 1953.

The executive employees of the Society cannot be responsible for obtaining signatures on partially completed petitions or on petitions incomplete by reason of unacceptable signatures (that is, signatures of other than Members and Fellows in good standing).

Nominations Received

On the date of going to press, the following Members had been nominated for the grade of Fellow:

For Fellow: H. O. Cook, Mass.
Charles S. R. Cowan, Wash.
George L. Drake, Wash.
Paul M. Dunn, Chile
Leo A. Isaac, Ore.
Earl W. Loveridge, D. C.
R. E. McArdle, D. C.
Elwood B. Moore, N. J.
R. R. Reynolds, Ark.
F. X. Schumacher, N. C.
T. Schantz-Hansen, Minn.
P. C. Wakeley, La.

Election Procedure

Fellows are not elected by the membership at large, but by a board of electors which consists of all present Fellows and the present Council. (A Council member who is also a Fellow has but one vote.)

To win election a candidate must receive an affirmative vote of not less than one-half the total votes cast.

Significance of the Grade

The highest membership distinction that can be conferred by the Society, this grade is awarded in recognition of outstanding achievement. Fellows do not pay increased dues; their dues are the same as those of Members.

Since the Society was founded in 1900, there have been 91 Fellows elected. At the present time the number of living Fellows is 62.

Since the last election in December 1951, two Fellows have died: J. W. Girard and Ellwood Wilson.

List of Fellows

The current roster of Fellows follows. The state in which each Fellow is domiciled and the year of his election are shown after his name.

Allen, Shirley W., Michigan, 1948.
Baker, Fred S., California, 1949.
Besley, Fred W., Maryland, 1940.
Brundage, F. H., Oregon, 1949.
Butler, Ovid, Maryland, 1940.
Carter, E., District of Columbia, 1942.
Chapman, H. H., Connecticut, 1922.
Clapp, Earl H., Maryland, 1930.
Clepper, Henry, Virginia, 1949.
Coffman, John D., California, 1946.
Curran, Hugh, Venezuela, 1951.
Damtoft, W. J., North Carolina, 1951.
Dana, S. T., Michigan, 1935.
Demmon, E. L., North Carolina, 1951.
Eldredge, I. F., Louisiana, 1942.
Evans, C. F., Georgia, 1949.
Ferguson, J. A., Pennsylvania, 1949.
Fischer, A. F., California, 1940.
Fritz, Emanuel, California, 1951.
Frothingham, E. H., California, 1942.
Gill, Tom, District of Columbia, 1948.
Granger, C. M., Maryland, 1946.
Greeley, W. B., Washington, 1918.
Guise, Cedric H., New York, 1951.
Guthrie, John D., Virginia, 1940.
Hall, W. L., Arkansas, 1940.
Hartley, Carl P., Maryland, 1949.
Hawes, A. F., Connecticut, 1939.
Hawley, R. C., Connecticut, 1942.
Heintzleman, B. F., Alaska, 1951.
Holmes, J. S., North Carolina, 1939.
Hosmer, Ralph S., New York, 1932.
Hunt, George M., Wisconsin, 1951.
Illick, J. S., New York, 1946.
Jeffers, D. S., Idaro, 1949.
Kelley, E. W., Montana, 1949.
Kellogg, R. S., Florida, 1949.

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Prentiss & Carlisle Co., Inc.
107 Court Street Bangor, Maine

Kinney, J. P., District of Columbia, 1942.
Koch, Elers, Montana, 1940.
Korstian, C. F., North Carolina, 1942.
Krueger, Myron, California, 1951.

Lowdermilk, W. C., California, 1948.

MacDonald, G. B., Iowa, 1944.
Marsh, R. E., District of Columbia, 1948.
Martin, Clyde, Washington, 1948.
Mason, D. T., Oregon, 1948.
Morrell, F. W., Virginia, 1951.
Mulford, Walter, California, 1939.
Munger, T. T., Oregon, 1946.
Munns, E. N., California, 1949.

Preston, John F., Maryland, 1948.
Price, Jay F., Wisconsin, 1951.

Schmitz, Henry, Washington, 1940.
Shirley, H. L., New York, 1951.
Show, S. B., California, 1948.
Siecke, E. O., Texas, 1946.
Sparhawk, W. N., New Hampshire, 1946.

Watts, Lyle F., Oregon, 1946.
Winslow, C. P., District of Columbia, 1942.
Wirt, G. H., Pennsylvania, 1948.
Ziegler, E. A., Pennsylvania, 1949.
Zon, Raphael, Minnesota, 1918.

Announcement of Applicants

Applicants for admission, advancement, or reinstatement whose membership applications were received in the Society office during the month of June are listed below.

Action regarding the eligibility of these applicants will be taken by the Council as of September 1, 1953. Any communications from voting members relating to the membership eligibility of any of these applicants should be received in the Society office prior to that date.

Allegheny Section

Student Grade

PENNSYLVANIA STATE COLLEGE

Johnson, A. L.

Junior Grade

Students Eligible for Automatic Advancement

PENNSYLVANIA STATE COLLEGE

Arnold, J. W.
Groman, W. A.
Hafley, W. L.
Harris, C. D.
James, R. E.
Kirkwood, H. C.
Munch, J.
Nelson, J. J.
Phillips, R. L.
Robinson, G. R.
Sheffer, H. W.
Slusser, N. F.
Stefanik, T. P.
Woodrow, R. E.
Zarichansky, J.

WEST VIRGINIA UNIVERSITY

Calhoun, H. R.
Canter, D. F.
Cromer, G. J.
Ferguson, R. B.
Gatrell, T. L.
Johnson, R. E.
Johnson, R. J.
Lockhart, R. E.
Steeley, B. E.
Toney, F. M.
Vinoski, E. B.

Member Grade

Connolly, R., Farmer Fieldman, U.S.D.A., Harrisburg, Pa.; Pa. State, B.S.F., 1943. (Junior, 1946).

McKeon, T. B., Field Tech., Pa. Game Comm., Harrisburg, Pa.; Pa. State, B.S.F., 1943. (Junior, 1946).

Snyder, R. E., Forester, Pocahontas Fuel Co., Pocahontas, W. Va.; Univ. of Ga., A.B., 1935; Yale, M.F., 1940. (Junior, 41R49).

Appalachian Section

Junior Grade

Dowling, B. J., Box 148, Perry, Fla.; Univ. of Fla., B.S.F., 1950.

Students Eligible for Automatic Advancement

NORTH CAROLINA STATE COLLEGE

Adams, P. W.

Member Grade

Hall, G. G., Professional Forester, 402 Cumberland Ave., N. Augusta, S. C.; Univ. of Ga., B.S.F., 1936. (Junior, 40R48).

Page, C. L., Forester, Forest Fire Protection, Savannah River Plant, Jackson, S. C.; N. C. State, B.S.F., 1939. (Junior, 41R46).

Affiliate Grade

Sands, P. H., Vice Pres., Van Yahres Tree Service, Inc., Cismont, Va.; Univ. of N. H., B. S., (Forestry), 1952.

Central States Section

Student Grade

MICHIGAN STATE COLLEGE

Cavalieri, A.	Paulsen, M. R.
Coates, A. J.	Ruppenthal, R. E.
Connelly, J. P.	Russell, R. G.
Cromell, W. H.	Stubbs, J.

UNIVERSITY OF MICHIGAN

Bowman, R. P.

Junior Grade

Penabaker, E. G., 2414 Prospect St., Flint, Mich.; Mich. State, B.S.F., 1951.

Soine, G., Farm Forester, Ohio Div. of Forestry, Cambridge, Ohio; Mich. State, B.S.F., 1938.

Students Eligible for Automatic Advancement

MICHIGAN STATE COLLEGE

Henley, K. D.	Mack, J.

UNIVERSITY OF MICHIGAN

Collins, R. A.

PURDUE UNIVERSITY

Oliphant, L. M.	Sester, A. J.

Member Grade

Meiners, P. J., Mgr., Hardwood Dept., M. B. Farrin Lbr. Co., Cincinnati, Ohio; Purdue Univ., B.S.F., 1942. (Junior, 1946).

Affiliate Grade

Koller, A. F., Woods Mgr., American Boxboard Co., Filer City, Mich.

Central Rocky Mountain Section

Junior Grade

Students Eligible for Automatic Advancement

COLORADO A & M COLLEGE

Crawford, R. J.	Lewis, T. E.
Doty, W. M.	Mote, D.
Dybing, C. D.	Roberts, N. L.
Evenden, G. W.	Snyder, D. E.
Hribernick, R. A.	Thorne, J. W.
Kielhorn, R. A.	Trecker, E. W.
Knaus, P. P.	Widmer, E. J.
	Yurich, S.

Columbia River Section

Junior Grade

Dannerell, W. L., Tbr. Appraisal Engr., Oregon State Tax Comm., Salem, Ore.; Oregon State, B.S.F., 1939.

Gardner, A. D., Forestry Aide, U.S.F.S., Lowell, Ore.; Colo. A & M, B.S.F., 1951.

Students Eligible for Automatic Advancement

OREGON STATE COLLEGE

Casey, R. P.	Lee, R. F.
Coughlan, B. M.	Madden, B. E.
DeSoza, H. L.	McDonald, E. C.
DuBay, J. L.	Metcalf, R. G.
Enberg, P. R.	Opatz, T. D.
Faulkner, H. G.	Owen, W. D.
Glidewell, L. D.	Paine, D. P.
Goodhard, A.	Penney, W. E.
Hancock, J. F.	Pepper, E. E.
Heigh, W. D.	Rankin, A. W.
Hill, L. L.	Resler, R. A.
Kahre, R. H.	Stiles, W. C.
Keene, D. F.	Tucker, J. A.
	Young, T. S.

Member Grade

Bever, D. N., Research Forester, Oregon State Board of Forestry, Salem, Ore.; Oregon State, B.S.F., 1942. (Junior, 1946).

Cummins, L. K., Production Engr., Umpqua Plywood Corp., Myrtle Creek, Ore.; Colo. A & M., B.S.F., 1943. (Junior, 1946).

Dixon, H. S., Cons. Asst., Oregon State Board of Forestry, Salem, Ore.; State College of Wash., B.S., (Forestry), 1934. (Junior, 36R50).

Dunn, L. C., Forester, Bur. of Land Mgmt., Portland, Ore.; Oregon State, B.S.F., 1941; M.F., 1942. (Junior, 1946).

Jeffers, D. N., Branch Forester, Weyerhaeuser Tbr. Co., Longview, Wash.; Univ. of Idaho, B.S.F., 1939. (Junior, 39R48).

Parker, A. L., Service Forester, State Forestry Dept., Oregon City, Ore.; Oregon State, B.S.F., 1927. Reinstatement.

Associate Grade

Shotts, C. F., Logging Engr., Gilchrist, Ore.; Oregon State, B.S., (Civil Engr.), 1949.

Gulf States Section

Affiliate Grade

Murphy, P. E., Asst. Forester, Hillyer, Deutsch, Edwards, Inc., Oakdale, La.; L.P.I., B.S., (Forestry), 1950.

Prather, W. A., Field Asst., International Paper Co., Buckatunna, Miss.

Inland Empire Section

Junior Grade

Kuechmann, J. H., Cons., S.C.S., St. Maries, Idaho; Univ. of Idaho, B.S.F., 1951.

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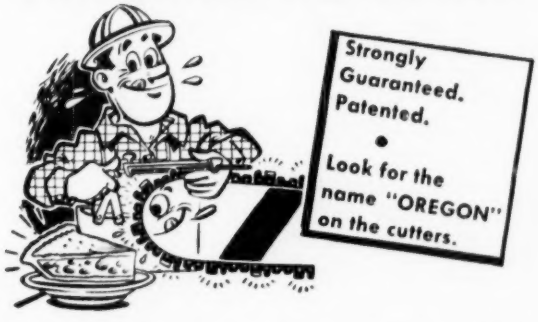

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Gissel, H. W. — Skjeie, E. L.
Lynch, J. C. — Taynton, R.
Schreck, W. R. — Tiedemann, R. K.

Member Grade

Baldwin, R. E., Asst. Rgr., U.S.F.S., Republic, Wash.; Mont. State Univ., B.S.F., 1946. (Junior, 1948).

Intermountain Section

Member Grade

Smith, C. E., Dist. Rgr., Grand Teton Natl. Park, Moose, Wyo.; Colo. A & M., (2 yrs.). (Junior, 34R50).

Kentucky-Tennessee Section

Junior Grade

Crowell, S. F., Forester-Supv., Sverdrup and Parcel Inc., Tullahoma, Tenn.; La. State, B.S.F., 1951.

New England Section

Junior Grade

Students Eligible for Automatic Advancement

UNIVERSITY OF MAINE

Dickson, T. L. — Geerinck, P. A.

YALE UNIVERSITY

Wright, A. W.

Member Grade

Dwinell, F. E., Cons. Forester, 7 King St., Barre, Vt. (Junior, 1946).
Hartranft, J. L., Forester, Oxford Paper Co., Portland, Ore.; Pa. State, B.S.F., 1940. (Junior, 41R48).
Whitman, F. G., Forester Hollingsworth and Whitney Co., Waterville, Me.; Univ. of Me., B.S.F., 1941. (Junior, 1948).

Affiliate Grade

Post, A. H., Box 33, Spofford, N. H.; Univ. of N. H., B.S., (Forestry), 1952.

New York Section

Student Grade

Andresen, J. W. — Leak, W. B.
Vimmerstedt, J. P.

Affiliate Grade

Jones, A. R., Company Forester, Muskoka Wood Prod., Ltd., Huntsville, Ontario, Canada; Univ. of Toronto, B.S., (Forestry), 1950.

Northern California Section

Junior Grade

Richey, L. E., Forest Tech., Calif. State Div. of Forestry, Redding, Calif.; Univ. of Calif., B.S.F., 1949.

Students Eligible for Automatic Advancement

UNIVERSITY OF CALIFORNIA

Best, R. H. — Orr, T. J.
Emrie, W. J. — Pease, W. E.
Miller, A. R. — Wade, D. N.
Wilde, F. B.

Affiliate Grade

Konnersman, G. A., Box 501, Larkspur, Calif.; Oregon State, B.S., (Forest Entomology), 1953.

Northern Rocky Mountain Section

Junior Grade

Ferrell, J. J., Cartographic Aide, U.S.F.S., Missoula, Mont.; Univ. of Mich., B.S.F., 1952.
Gorsuch, R. V., Forester, U.S.F.S., Troy, Mont.; Univ. of Idaho, B.S.F., 1951.
Heyn, P. A., Forester, U.S.F.S., Missoula, Mont.; Univ. of Minn., B.S.F., 1952.

Students Eligible for Automatic Advancement

MONTANA STATE UNIVERSITY

Hearst, A. L. — Smith, E. E.
Heckman, J. H. — Steiner, R. W.
Rogers, C. M. — Yarnall, J. L.

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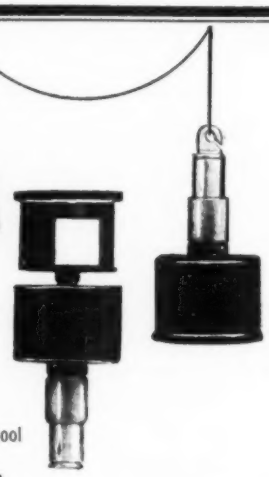

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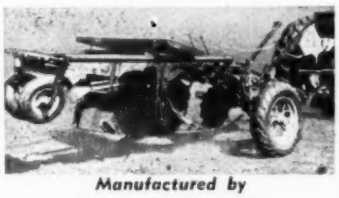

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Palley, M. N., Forester-in-charge, Inventory, Dept. of Natural Resources, Prince Albert, Saskatchewan; Univ. of Michigan, B.S.F., 1942; M.F., 1942.

Ozark Section

Junior Grade

Stockton, R. D., 122 W. Miller St., Jefferson City, Mo.; Univ. of Mich.; B.S.F., 1950; M.W.M., 1953.

Affiliate Grade

Buffaloe, F. L., Forestry Aide, Bur. of Land Mgmt., Russellville, Ark.
Griffin, B. C., Land Appraiser, Burl. of Land Mgmt., Russellville, Ark.

Puget Sound Section

Junior Grade

Emerson, J. L., Asst. Regional Forester, U.S.F.S., Juneau, Alaska; Univ. of Mont., B.S.F., 1928. Reinstatement.

Member Grade

King, James E., Asst. Research Forester, Weyerhaeuser Tbr. Co., Centralia, Wash.; Utah State, B.S.F., 1941; Univ. of Idaho, M.S., 1947. (Junior, 1946).

Affiliate Grade

Wedmer H. A., Forestry Aide, Weyerhaeuser Tbr. Co., Snoqualmie Falls, Wash.; Federal Univ. of Tech., Zurich, Switzerland.

Associate Grade

Pauley, J. C., Property and Tax Agent, Rayonier Inc., Hoquiam, Wash.

Southeastern Section

Junior Grade

Hammond, J. E., Asst. Dist. Forester, Ga. Forestry Comm., Newnan, Ga.; Univ. of Ga., B.S.F., 1949.
Forth, F. F., Resident Forester, St. Regis Paper Co., Warwick, Ga.; Univ. of Fla., B.S.F., 1947.

Students Eligible for Automatic Advancement

UNIVERSITY OF FLORIDA

Caldwell, W. H.	Patterson, E.
Edson, J. A.	Phillip, A. H.
Candy, J. D.	Schroter, D. A.

UNIVERSITY OF GEORGIA

Bauerband, R. L.	Kearse, C. M.
Churchwell, N. R.	Kennedy, U. B.
Cote, A. J.	Marshall, C. M.
DeMars, C. J.	McLees, J. H.
Dennis, C. S.	Reeves, J. D.
Herndon, P. H.	Sheppard, J. A.

Member Grade

Anderson, G. A., Forester, Brunswick Pulp and Paper Co., Brunswick, Ga.; Colo. A & M., B.S.F., 1940; Duke, M.F., 1946. (Junior, 1946).
Ayres, E. K., Cons. Forester, Coosa River Newsprint Co., Coosa Pines, Ala. (Junior, 1946).
Bennett, F. A., Research Forester, S. E. Forest Exp. Sta., Cordele, Ga.; Univ. of Ga., B.S.F., 1938; Duke, M.F., 1951. (Junior, 1939).
Bilstein, R. T., Forester, T.V.A., Wilson Dam, Ala.; Univ. of Minn., B.S.F., 1941. (Junior, 1946).
Chappell, F. C., Forester, Adkins Mfg. Co., Gainesville, Fla.; Univ. of Fla., B.S.F., 1940. (Junior, 1946).
DeLoach, H. G., Director, Ga. Forestry Comm., Atlanta, Ga.; Univ. of Ga., B.S.F., 1939. (Junior, 46R50).
Gabriel, E. T., Land and Tbr. Agent, Savannah River Lbr. Corp., Savannah, Ga. (Junior, 36R51).
Gill, J. J., Asst. Wood Procurement Supv., Macon Kraft Co., Macon, Ga.; State Univ. of N. Y., B.S.F., 1942. (Junior, 1946).
Hopkins, W. S., Forester-in-charge, S. Forest Exp. Sta., Marianna, Fla.; Colo. A & M., B.S.F., 1937. (Junior, 39R48).
Laird, J. H., Pulpwood Dealer, Greenville, Ala. (Junior, 1945).
Milono, J. B., Dist. Forester, Int. Paper Co., Richmond Hill, Ga.; Pa. State, B.S.F., 1941. (Junior, 1946).
Sherrill, A. P., Forester, Sherrill and Bach, Atmore, Ala.; Univ. of Ga., B.S.F., 1942. (Junior, 1946).
White, H. W., Unit Mgr., St. Joe Paper Co., Westbay, Fla.; Univ. of Ga., B.S.F., 1938. (Junior, 1946).

Affiliate Grade

Gibson, H. M., Forestry Aide, U.S.F.S., Moulton, Ala.

Upper Mississippi Valley Section

Junior Grade

Students Eligible for Automatic Advancement

UNIVERSITY OF MINNESOTA

Arrasmith, P. W.	Kuester, A. F.
Christ, D. M.	Laab, M. G.
Crellin, J. S.	Leuthauser, A. H.
Dale, M. E.	Martin, C. J.
Fulton, M. D.	Mitchell, L. A.
Hanisch, R. L.	Shaw, A. F.
Kale, W. S.	True, M. G.
	Twito, R. H.

Affiliate Grade

Wroe, E. W., Dist. Rgr., Nimrod Rgr. Sta., Sebeka, Minn.

Wisconsin-Upper Michigan Section

Junior Grade

Schmiege, D. C., Forest Rgr., Wis. Cons. Dept. Antigo, Wis.; Univ. of Minn., B.S.F., 1952.

Member Grade

Koenings, R. H., Supv., Farm Forestry, Wis. Cons. Dept., Waupaca, Wis.; Mich. State B.S.F., 1946. (Junior, 1946).

Affiliate Grade

Jacobson, C. E., Prod. Mgr., Wheeler Lbr. Bridge and Supply Co., Superior, Wis.
Krumbach, A. W., U. S. Air Force, Mich. College of Mining and Tech., B.S., (Forestry), 1952.

Foreign

Corresponding Grade

Dozal, Ing. Jesus Saenz, Mgr., "Union de Madereros," Chihuahua, Mexico.

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Forestry News

Establish Largest Test of Southern Pine Tree Races

During the past winter, over 180 thousand pine seedlings were planted throughout the South in a series of tests designed to investigate the existence and distribution of geographic races of the four major southern pines. This was announced by the Committee on Southern Forest Tree Improvement at a recent meeting in Georgetown, South Carolina.

Philip C. Wakeley of the Southern Forest Experiment Station, U. S. Forest Service, heads the subcommittee studying geographic effects. Three hundred cooperators from private, state, and federal forestry agencies are participating.

The purpose of the tests, Wakeley said, is to determine whether genetic differences exist between southern pines of the same species grown under different climatic conditions or on lands of different geological origin. The four pine species under investigation are loblolly, slash, shortleaf, and longleaf.

Previous investigations strongly indictate that such geographic races do exist for loblolly pine and that the various races differ tremendously in rate of growth, resistance to disease, and ability to withstand low temperature. Planting trees of a given race outside of the region to which they are adapted may mean loss of many thousands of dollars in growth or, sometimes, complete failure. It is hoped that the present study will enable foresters to define racial ranges for the major southern pines.

The seedlings for this test were grown in 19 different nurseries from seed collected in nearly every southeastern state from New Jersey south to the tip of Florida and west to Texas and Oklahoma. The 1,552 plots in which the seedlings were planted are similarly distributed.

Additional plantings will be made during the coming winter. When fully established, the test will involve some 223 thousand trees planted in 1,844 individual test plots—probably the largest single test of its kind in the world.

The study is part of a larger program of forest genetics investigations being guided by the Committee on Southern Forest Tree Improvement. This committee, made up of public and private foresters and geneticists, has as its objective the improvement, through genetics, of the quality of trees grown in southern woodlands. Present chairman of the committee is Dr. C. M. Kaufman, director of the School of Forestry of the University of Florida.

FOR THE FIRST TIME since the end of World War II, state and federal forest fire lookouts will double as Ground Observer Corps posts this summer. Leading the way are 79 California lookout towers which opened in May.

Besides keeping their normal fire vigil, the lookouts will also report all aircraft in their area and have a geographical code name just like the regular 2,700 Ground Observer Corps posts throughout the country.

The official entrance of forest protection organizations into the country's defense program was realized recently when a Western Air Defense Headquarters liaison man, A/1C Ernest M. Davis, met with Mr. Raymond Higgins, Sacramento District Fire Prevention Officer, and Mr. Charles Wagener, Assistant Ranger of the Mt. Danaher Fire Station.

After last minute operational problems were eliminated, the Air Force spokesman opened the new 110-foot steel Mt. Danaher tower, marking a vital step in strengthening the country's defense against a sneak air attack.

Since most of the forest lookouts lie within rugged, lightly populated areas, their use will guard areas which otherwise would leave a clear, unwatched path for enemy bombers to fly undetected.

Photo U. S. Air Force

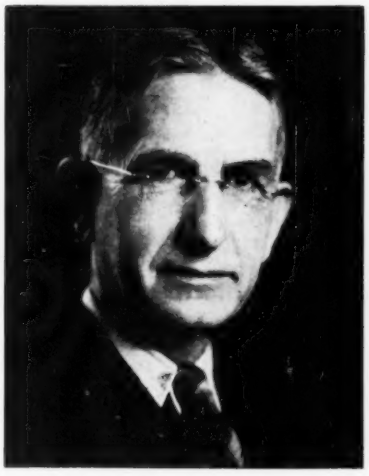
South's Pulpwood Cut Sets Another Record

In 1952, for the third straight year, the South harvested a record amount of pulpwood and easily kept its position as the Nation's chief pulpwood-producing region. A report released recently by the Forest Service shows that the 12 southern states last year cut a total of 14,600,000 cords of pulpwood. This was considerably more than half of the total U. S. cut of 25,000,000 cords for 1952.

The South's pulpwood cut in 1952 was estimated at nearly 4 percent larger than in 1951, and 17 percent greater than in 1950. All southern States except Virginia and Oklahoma showed increases. The largest rises were in Alabama, Georgia, and Louisiana.

Georgia was the leading producer with 2½ million cords. Mississippi ranked second with 1,800,000 cords. Alabama and Florida were next with about 1,600,000 cords apiece, and all other southern states except Arkansas, Tennessee, and Oklahoma produced more than a million cords apiece.

More hardwood trees are being used for pulp, the report indicates. Last year, hardwood made up 1,700,000 cords of the South's total, a gain of 17 percent over 1951.



Samuel Trask Dana: Dean emeritus of the School of Natural Resources, University of Michigan.

Forester and educator, a graduate of Bowdoin College and the Yale School of Forestry, you have inspired men with the belief that conservation of our natural resources will foster the welfare of our country. Should the trees go forth again to anoint a king over them, they could not do better than to choose you. Your Alma Mater is proud to confer upon you the degree of Doctor of Science.

Citation by A. Whitney Griswold, President of Yale University, at commencement exercises June 8, 1953.

Granger to Represent Independent Forest Farmers

The Independent Forest Farmers of America have appointed Christopher N. Granger, retired assistant chief of the U. S. Forest Service as Washington representative.

The headquarters of I.F.F.A. are at 441 Ridgewood Avenue in Minneapolis.

PROF. ERNEST WOHLETZ, who has been on the forestry faculty at the University of Idaho, Moscow, for the past 16 years, has been promoted to dean of the School of Forestry and Director of the Forest, Range and Wildlife Experiment Station. He succeeded Dean D. S. Jeffers who was retired July 1.

Born in Nekoma, N. Dak., July 10, 1907, Wohletz was graduated in forestry at the University of California in 1930. After teaching at the university for three years while working for an advanced degree, he served for two years with the California Forest and Range Experiment Station, and joined the forestry faculty at Idaho in 1937.

Canada Begins Tree Farm Program

Canada's private forest lands are to be marked by special insignia, under a new Canadian Forestry Association program, headed by the National Tree Farm Committee.

The Canadian Tree Farm Committee, comprised of forest industry, business and government leaders, will head programs to improve millions of acres of sub-marginal forest land. The work, which will center on local committees, is coordinated with forest industry and forest services.

Tree Farms will be certified, after nomination by foresters of local Tree Farm Committees, when owners agree to maintain land for growing forest crops; to protect land adequately; agree that cutting practices will be satisfactory to ensure future forest crops, and permit inspection by committee foresters.

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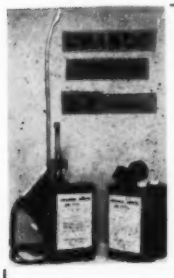

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Tillamook Burn Reforestation One Third Done

The tremendous job of reforesting the vast Tillamook burn area is one third done.

Starting in 1949, helicopters have seeded 36,000 acres and ground crews have planted nearly 12 million seedlings on the charred acres of the burn. In addition, great strides have been made in fire protection phases of the program.

Nearly 50 miles of fire breaks have been established, 185,000 snags felled, 120 miles of access roads built or improved and better fire control facilities and outlooks established.

The story of the reforestation project is brought up to date in a thesis prepared for the Oregon State College School of Forestry by Rudy M. Kallander of Salem, who heads the vast program for the state board of forestry. Kallander submitted the thesis this spring for his master's degree in forest management.

The complete rehabilitation program for the 252,964 acres of state land within the 360,882-acre burn area is expected to take another 10 years. Total cost for the project is figured at about 10 million dollars.

Progress in the next few years will be slower, Kallander reports. A good portion of the lands ready for rehabilitation have been treated to date and major salvage logging must be completed on additional acres before much more reforestation work can take place.

Helicopter seedings have speeded the reforestation program. They are made in all cases where cover and soil conditions are good enough to make the aerial operation practical. Hand planting crews do the job in the problem areas, along roads and fill in spots where the aerial seeding stand is poor.

Great emphasis is being given to fire protection phases as well as the planting and seeding operations to insure that the devastating fires of 1933, 1939 and 1945 are not repeated in the area.

Entomologists Use Radioactive Insects in Study

Entomologists of the U.S.D.A. are planning new uses of radioactive insects and insecticides to find out how far and how fast insects fly, how an insecticide kills an insect, and just how some insects develop resistance to insecticides.

Since insects do great damage themselves, and often carry diseases of plants, humans and animals, the knowledge of how far they may travel in a known time helps the entomologist in insect control. An insect "tagged" with one of the radioisotopes can be detected by a counting mechanism, even when out of sight . . . for example, under the bark of a tree. Similarly, a "tagged insecticide can be traced into an insect's small body to see what physiological changes take place . . . or perhaps fail to take place as an insect develops resistance to an insecticide."

For example, J. M. Davis, entomologist at the Agricultural Research Center at Beltsville, Md., will "tag" the destructive bark beetle with a radioisotope of scandium, one of the lesser known chemical elements, which emits a powerful gamma ray. Weak trees to which such beetles fly, located at various distances from the point of release, may be used as natural traps to check distances beetles migrate. "Scintillation counters," which are sensitive to gamma rays will, Mr. Davis believes, reveal presence of the treated (radioactive) insects that have burrowed beneath the bark and even as far as six inches into the tree "traps."

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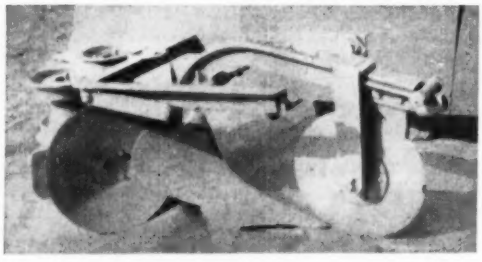

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WEST MONROE LOUISIANA

Increased Use of Preservatives for Wood

The amount of wood materials treated with preservatives increased 3 percent during the past year, according to a preliminary report issued by the Forest Service.

This information, compiled by Henry B. Steer of the Forest Service, in cooperation with the American Wood Preservers' Association, is based on reports from 278 wood treating plants in 42 states. They represent more than 95 percent of the capacity of the industry.

The amount of wood treated in 1952 totaled 310,928,110 cubic feet as compared to 302,471,317 cubic feet treated a year ago. The greatest increase in use of wood preservatives was on fence posts with 30 percent more treated in 1952 than in 1951. Use of preservatives on cross ties, switch ties, wood blocks and lumber also increased. Not as many poles, piling for docks and wharves, timbers or crossarms, however, were treated with preservatives in 1952 as in 1951.

State Forestry Ass'n Executives Hold Annual Meeting

The fifth annual meeting of the Council of State Forestry Association Executives was held at Old Point Comfort, Va., on June 17 and 18. Twenty members and guests attended.

New officers were elected as follows:

Chairman: James H. Kitchens, Jr., of Louisiana succeeded William E. Cooper of Virginia.

Vice chairman: Ralph Chamberlin of Pennsylvania succeeded Harris A. Reynolds of Massachusetts.

Secretary: Bruce F. Stewart of Texas succeeded A. W. Kelly of West Virginia.

E. L. Heermance Honored Posthumously by New Eng. Group

The New England Council honored Edgar L. Heermance (1876-1953) posthumously on June 11 by presenting his widow with a silver cup and a citation for his part in the development of the Northeastern Wood Utilization Council, and his active interest in the advancement of modern forestry practices throughout the Northeast, particularly on the small ownerships.

Mr. Heermance was a graduate of Yale College and the Yale Divinity School, and entered the ministry immediately after graduation. After retiring from the ministry, he became interested in the problems of the small woodland owner in Connecticut. At the time of his death, he was executive secretary of the Northeastern Wood Utilization Council; Secretary of the Connecticut Forest and Park Association; treasurer and director of Connwood, Inc.

F.F.A. Moves Hdq. to Atlanta

The Forest Farmers Association, a voluntary non-profit timberland owners organization founded in Valdosta, Georgia, in 1941, has moved its headquarters to Atlanta.

J. V. Whitfield, association presi-

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Blade set at 10° for cutting
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dent, said that the move would allow it to give better service to its membership and offer it greater opportunities for growth and expansion. At present the F.F.A. has 1,300 members, owning more than 20,000,000 acres of timberland in 15 southern states. Its primary aim is to "encourage private forest endeavor and full forest development."

Government

Inter-State Fire Compact Sought in South

A number of southern states are considering a proposal for the development of integrated forest fire plans including exchange of services and equipment aimed at better forest fire protection. The proposal is similar in its aims to those of the New England Forest Fire Compact. The states included are Arkansas, Louisiana, Mississippi, Oklahoma, Texas, and Missouri.

McArdle Reports F.S. Aircraft Use in 1952

Richard E. McArdle, chief of the Forest Service, reports that during 1952 the Forest Service used airplanes for a total of 10,705 hours. The planes transported 8,148 men and carried 529,087 pounds of cargo, dropping 248,144 pounds by parachute.

The Forest Service's 17 planes were used for 3,078 hours. Armed Services planes were used for 122 hours and commercial planes were hired for the remaining 7,505. Helicopters—all commercial—were used on 8 flights for a total of 76 hours. They were used mainly to transport men to fires.

F. S. Continues use of Smokejumpers

Approximately 250 smokejumpers will be used during this year's fire season as the first line of defense on fires in the back country of the West, the Forest Service has announced.

Last year's smokejumper crews, which totalled about the same number, were used to stop 267 forest fires while they were still small. They made 836 jumps to fires and fought them for a total of 2,375 man-days.

A smokejumping crew of 150 men will be stationed at Missoula, Mont., Another 50 will be stationed at McCall, Ida., and 50 will be on the Siskiyou and Chelan National Forests in Oregon.

Webster to Succeed Orell as Washington State Forester

L. T. Webster, assistant state forester of Washington, will succeed B. L. Orell as state forester after August 1. Mr. Orell is to handle natural resource matters for Weyerhaeuser Sales Company at St. Paul, Minn.

S. C. Plants 32 Million Seedlings

More than 22 million forest seedlings grown by the S. C. State Commission of Forestry were distributed to South Carolina landowners during the past planting season, according to State Forester C. H. Flory. Of the 22,035,850 forest tree seedlings grown by the Commission, 8,966,500 trees were planted by forest industries, and 6,271,700 were planted by farmers. The remainder were planted by schools, other industries, small owners, associations and clubs, public organizations, and others.

In addition to the 22 million trees grown by the commission, approximately 10 million trees grown at the Stuart Forest Tree Nursery in Louisiana were planted in South Carolina on the Savannah River Project area of the Atomic Energy Commission.

Victor A. Clements Dies in California

Victor A. Clements, research forester in charge of tree volume and growth studies at the California Forest and Range Experiment Station of the U. S. Forest Service, died at his home in Berkeley on May 23.

Born in Fairmede, Saskatchewan, Canada, on June 25, 1902, he attended elementary and high schools in Sonoma, California. After graduating from the University of California School of Forestry in 1926, he was employed by the Experiment Station as a field assistant until 1928, when he was appointed junior forester and transferred to the Washington, D. C. headquarters of the Forest Service. In 1931 he returned to the experiment station in Berkeley.

H. A. Fowells Transferred to D. C.

Harry A. Fowells, research forester of the California Forest and Range Experiment Station has been transferred to the Division of Forest Management Research in Washington, D. C., it has been announced by Station Director Stephen N. Wyckoff. He succeeds Walter M. Zillgitt, who is being transferred from the Washington office to Missoula, Montana.

A native of Portland, Oregon, Fowells has been conducting studies in silvics and forest regeneration in California since 1934, when he was assigned to the Berkeley Experiment Station. He received a Bachelor of Science degree from Oregon State College School of Forestry in 1932 and a Master's degree in 1933. Since 1949 he has done graduate work in plant physiology at the University of California.

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The new Nelson Tree Marking Paint does not settle, thicken, or skin over—can be used direct from the can with no mixing. It is durable, not absorbed into wood or bark, retains high visibility—offers every property foresters have long wanted . . . (every color, too—yellow, white, orange, blue, red).

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The NEL-SPOT gun has a reversible tip in the nozzle to blow out dirt, a cap to prevent paint drying in the gun, a cleaning wire set in the cap to keep the orifice open.

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Robert E. Wolf Transfers to Bureau of the Budget

Robert E. Wolf, forester with the Bureau of Land Management, has been transferred to serve with the Bureau of the Budget in Washington, D. C. Wolf served with the B.L.M. as district forester at Russellville, Arkansas, in Portland and Eugene, Oregon, on the O & C lands, and with the Forest Service in Region 6. He is a 1947 graduate of the State University of New York College of Forestry at Syracuse and also received his M.F. from that school in 1948.

Brandner to N.W.R.O.

H. Phil Brandner, Mount Baker National Forest supervisor since 1944, has been transferred to a staff position in the Portland regional office of the Forest Service.

In his new position, Brandner is responsible for land utilization plans for the national forests of Oregon and Washington, workload studies to improve organization, space allocations, and other special studies. He is assigned to the Division of Operation.

A native of Wisconsin, the new regional office staff man has had extensive administrative experience in forestry throughout the United States.

H. A. Harrison Becomes Mt. Baker N. F. Supervisor

Henry A. Harrison has been promoted to supervisor of the Mount Baker National Forest, with headquarters in Bellingham, Wash., it was announced recently by Regional Forester J. Herbert Stone.

Assistant supervisor of the Snoqualmie National Forest since 1950, Harrison succeeded H. Phil Brandner who transferred recently to the Portland regional office.

L. O. Barrett Transferred to Snoqualmie National Forest

Transfer of Supervisor Laurence O. Barrett from the Gifford Pinchot to the Snoqualmie National Forest has been announced by Regional Forester J. Herbert Stone. The transfer is effective June 7.

A native of Washington and a 1932 graduate of the University of Washington School of Forestry, Barrett succeeds W. H. Johnson who recently moved to the Alaska region.

Bigley Appointed to Wash. State Land Board Post

Michael Bigley, of Kent, Washington, has been appointed technical consultant to the State Land Board of Washington, it was announced recently.

Mr. Bigley has been chief forester for the land board since January. His new duties will be to advise the board on technical matters and to hire and

Michael Bigley

supervise timber cruisers to check on the work of cruisers employed by the Land Office.

James G. Kaiser, formerly with the U. S. Forest Service, will succeed Mr. Bigley as chief forester.

New B.L.M. Regulations Expedite Timber Salvage Sales on O & C Lands

Three measures which will speed up the Bureau of Land Management's timber salvage program on the O & C lands of western Oregon were announced in June.

Through an amendment to the O & C timber salvage regulations, the B.L.M. is authorized to sell without advertising to a holder of an O & C timber

The new pour-type flat can shown above becomes the standard gallon container for SOUTHERN GLO Ready-Mix tree-marking paint. Proven more convenient for pouring and carrying in the field, these are packed six to a carton . . . unit price is the same as old-style round gallons.

Since this new pour-type container was offered through this column three months ago, we find an ever-increasing demand for it by SOUTHERN GLO ready-mix users. Its use made possible by the development of SOUTHERN GLO's stay-mixed formula #71020 which requires no stirring,—the new container will replace the old-style round gallon unless the user states preference for the latter on his order.

Incidentally, the new container came as the direct result of a suggestion made first by a Down-East forester to this column about five months ago. Response to his letter snowballed, and thus, the new improved can came to be.

—about paint carriers for refills in the field?

This question, introduced some months ago, is still drawing interesting replies. For instance,—

From Kentucky comes this practice:

"I use a hunter's vest-type pack with large pockets in the back and smaller side pockets; fastened in front with short strap and buckle. Small-opening gallon can, tally board, etc., go in the back; lunch and small equipment in the sides. Zipper fastening on one side of rear pocket makes it easier to load and unload.

"This arrangement leaves hips free to carry only belt axe and canteen . . . which is plenty."

This forester continues with what may be the crux of the whole situation:

"I find in marking hardwood timber for selective cutting, that 1 to 1½ gallons keeps two guns operating for half a day. That's about one gallon per 100 M board feet. More stems per acre use paint at a faster rate, of course."

We at Southern Coatings are still working on this, and will be glad to pass along your solution to the profession.

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Dept. K-2, Sumter, South Carolina

sale contract small volumes up to 5 hundred thousand board feet of timber which become windthrown, insect damaged or fire-killed after the original sale was made and is on or is close to the existing contract area so that sale of the damaged timber to another operator is impractical. Such a sale must be determined to be in the public interest. Prior to this new regulation, sales of any volume greater than 100,000 feet board measure had to be advertised causing needless delays in the program, and deterioration of timber.

The second measure, a redelegation of authority order, will permit district foresters having jurisdiction over O & C and public domain lands in and west of Range 8 East, Willamette Meridian in the State of Oregon to act on contracts and other matters relating to any timber sale involving an estimated stumpage volume of not to exceed 1,000,000 feet board measure of timber.

A third measure is Secretarial approval of a policy statement permitting the sale up to 250,000 board feet of salvage timber without guaranteed use of access roads to the timber.

The B.L.M. timber salvage program was started immediately after the first of a series of disasterous fires and wind storms which began in the summer and fall of 1951.

Lane Receives U.S.F.S. Certificate of Merit

Richard D. Lane, forester in charge of the U. S. Forest Service Carbondale Research Center on the campus of Southern Illinois University, has been awarded a Certificate of Merit by the U. S. Forest Service.

The certificate was awarded for "extraordinary skill, resourcefulness, and leadership in development and operation of forest research programs in cooperation with state and private organizations in southern Illinois."

In addition Lane was awarded a Meritorious Promotion for Superior Accomplishment, one of the highest awards that can be earned by an employee of the U. S. Department of Agriculture, Forest Service.

One of Lane's outstanding accomplishments was his successful demonstration that certain forests of southern Illinois that had been allowed to deteriorate for over a century could be rehabilitated at a profit. In so doing at the Kaskaskia Experimental Forest Lane and his staff contributed greatly toward solving one of the pressing problems confronting the economy of southern Illinois.

Industry

Jack Larson Joins Consulting Firm

Jack E. Larson, a licensed surveyor and forester, will join the firm of Wall and Larson, Foresters, Sacramento, Calif. Larson has had 16 years' experience with the lumber industry, the U. S. Forest Service and the railroads. For the past three years he has been in charge of log purchasing and logging for the Bercut-Richards Lumber Company.

Georgia's First Tree Farm "Family" Organized

More than 375 persons gathered near Atlanta, Ga., May 26, to honor Georgia's first—and the nation's second—"Tree Farm Family."

Talks by Governor Talmadge, State Forester Guyton DeLoach, and George West, president, West Lumber Co., preceded awarding of Tree Farm certificates and signs to 24 landowners.

The landowners have become known as the "Tree Farm Family" because of their mutual interest in taking advantage of a plan offered by the West Lumber Company to provide small woodlot owners free professional supervision and management of non-company owned forestlands without cost or obligation.

A forestry demonstration, under the direction of West Lumber Company industrial foresters E. T. Hawes and L. C. Hart, Jr., preceded presentation of American Tree Farm certificates and signs to the landowners by Governor Talmadge and State Forester DeLoach. A tour of the grounds followed.

Wm. Price Manages Shultz Seattle Office

William H. Price has been appointed manager of the office of the C. D. Schultz and Co., consulting foresters and engineers in their new headquarters in Seattle, Wash.

Price is a forestry graduate of the University of Washington, class of 1926. He served formerly as managing forester for the Weyerhaeuser Timber Co., in the Tacoma headquarters offices; he was general manager of Shasta Forests Co. at Redding, Calif.; and more recently he was associated

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with a hardwood development in the Philippines.

The Seattle office is an affiliate of the C. D. Schultz Co., Ltd., of Vancouver, B. C. The Canadian office maintains a permanent staff of some 60 persons. It serves as forest consultant for the New Zealand government and currently has an assignment in New Guinea. The Seattle office will be equipped to provide service on a wide variety of forestry jobs in fir, pine, and tropical woods. This will include appraisals, cruising, management, photogrammetry and engineering.

J. N. Kutack Given New Job with International Paper Co.

Jason N. Kutack has been appointed International Paper Company's conservation forester for Mississippi, it was announced recently by D. V. Logan, division superintendent of wood procurement for that company.

Mr. Kutack has a Master of Forestry degree from the University of Michigan and has worked as forester in both the Timberlands and Conservation Department of International Paper Company in Mississippi and Louisiana.

W. Va. Pulp and Paper Co Buys Timber Lands in N. C.

West Virginia Pulp and Paper Company will purchase additional timber reserves in North Carolina as a result of a transaction completed in May with Richmond Cedar Works, a Virginia corporation with main offices in Norfolk, Va., it was announced by officials of the paper company.

A spokesman said that the paper company had exercised an option to purchase approximately 136,000 acres of land in Dare, Hyde, Tyrrell and Washington counties.

The property will be operated and managed as part of the company's North Carolina woodlands project, which is directed by William Ernst, Jr., of Manteo, N. C. The company acquired considerable timberland in Dare County last year when it purchased about 150,000 acres from Dare Corporation.

N. C. 4-H Club Contest Winners Named

Clemson Agricultural College extension service, in cooperation with pulpwood companies doing business in North Carolina, has announced winners in the 4-H Club one-acre timber

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GEORGE W. FISCHER, *The State College of Washington*

NEW inclusive guide gives a taxonomic account of all presently recognized and classified smuts of North America. Includes 22 genera, 276 species, and a few varieties on species of 242 host genera-with photographs of most smuts. For easy reference hosts are listed geographically, and there is a host genus index and key. 136 illus., 343 pp. **$8.75**

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A GUIDE to the Literature, with Bibliography. This time-saving reference work provides an accurate introduction to the literature on the biology and control of some 330 species of smut fungi and the diseases they cause. Puts at your fingertips the entire range of published information in the field. 157-page bibliography represents more than 3000 scientific papers, bulletins, and books. 387 pp. **$8.50**

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thinning contest. 36 youngsters won prizes including wrist watches, baseball gloves, and a total of $137.50 in cash awards.

Awards were given on the basis of efficiency in thinning the crowded stands of pine in demonstration plots. During the contest 153 demonstrations in timber thinning were given at schools in 15 counties, and 4,076 club members attended.

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Companies which supplied prizes were West Virginia Pulp and Paper Co., International Paper Co., Champion Paper and Fibre Co., Sonoco Products Co. and Canal Wood Corp.

Swedish Research Forester Joins Weyerhaeuser Timber Co.

Newest addition to Weyerhaeuser Timber company's forestry research staff at Centralia, Washington, is N. Ake Wiksten, a forester from Sweden.

Wiksten, who was born in Oestersund, Sweden, 37 years ago, spent a good share of the last dozen years studying and working on forestry research in Sweden, Switzerland and British Columbia, before joining Weyerhaeuser in April.

He is a 1941 graduate of the Royal Academy of Forestry at Stockholm with an M.F. degree, and worked from 1942 to 1950 for the Forest Research Institute, a Swedish government agency concerned with long-range research projects. In 1950 he went to British Columbia to do research forestry for Alaska Pine and Cellulose, Ltd, before joining Weyerhaeuser in April of 1953.

Smokey Scarfs For Green Guards

Smokey Bear Scarfs—with Smokey and the entire forest family portrayed in bright natural colors—will be awarded to girl members of the Green Guards performing meritorious services in Oregon forests, Albert Wiesendanger, executive secretary for the Keep Oregon Green Association announces.

Outstanding work in preventing man-caused forest fires, such as reporting fires to the nearest ranger or fire warden; extinguishing abandoned camp fires; making window displays and posters and setting up fire prevention exhibits at county fairs, will be the basis for awards, Wiesendanger advised. He said that the boys have been receiving pearl-handled pocket knives for outstanding fire prevention work and the girls will now be given the attractive Smokey scarf.

Ehrhart Now President of Armstrong Forest Company

Edmund Ehrhart, president of the American Pulpwood Association has been made president of the Armstrong Forest Company.

Ehrhart is now serving his second term as President of A.P.A. His woods work began in 1911 with a year's experience in timber sales on the Deerlodge National Forest in Montana, prior to his graduation in forestry from Penn. State in 1913. Timber cruising on pulpwood limits in Quebec provided a temporary job until he entered the employ of the Armstrong Forest Company at Johnsonburg, Pa. in January 1915. After World War I, during which he became a naval aviation pilot, he returned to the company and became vice president in 1945.

Tree Farm Dedicated by Puget Sound Pulp and Timber Co.

Puget Sound Pulp and Timber Co. dedicated its new 33,680-acre Puget Sound Pulp Tree Farm, at Mt. Vernon, Washington, June 12 with a day-long inspection trip for a group of private and government foresters, county and public officials from the area. S.A.F. members who attended were William Catlow, chief forester of Puget Sound Pulp and Timber Co.; W. D. Hagenstein, forest engineer, and former associate editor of the JOURNAL; and W. B. Greeley, director, Industrial Forestry Association.

★ ★ ★

THERE ARE about 60,000 sawmills, 650 veneer and plywood plants, and 200 to 250 pulpwood mills in the United States today.

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Education

State Univ. of N.Y. Develops New Hardwood Pulp Process

A new process of making stronger pulps from hardwoods at lower cost has been developed at State University of New York College of Forestry, it was announced recently by Dr. Robert M. Husband, research associate at the college.

Dr. Husband pointed out that researchers have prepared semi-chemical pulps of improved strength from birch and maple woods, with less than half the amount of chemicals commonly recommended for the neutral sulphite process. They have also converted birch into a high-yield chemical pulp suitable for bleaching and high-grade papers.

Improvement of the semi-chemical pulping process is the second major result of hardwood pulping research at State University of New York College of Forestry. In 1950, the college revealed discovery of the chemigroundwood process, first successful commercial method of making good, cheap paper pulp from hardwoods. Research for both studies has been sponsored by the college and Empire State Paper Research Associates, Inc., a cooperating group of 22 pulp and paper mills in the U. S., Canada, Italy, France, and South Africa.

50th Anniversary Reunion of Mont Alto Forest School

The 50th anniversary of the establishment in 1903 of the Pennsylvania State Forest Academy at Mont Alto was observed at a reunion of 105 alumni and former faculty members on June 12 and 13. Later renamed the Pennsylvania State Forest School, this institution was the only one ever established by a state to train foresters wholly for state service.

It functioned as an independent technical school for 26 years during the period 1903-1929. In the latter year it was merged with the Pennsylvania State College.

Two former directors of the academy attended the reunion: George H. Wirt of Camp Hill, Pa., who served as the first director (1903-1910); and E. A. Ziegler of Lewisburg, Pa., who was director from 1910 until 1929.

Among the alumni who participated on the 50th anniversary program were Henry Clepper, Washington, D. C.; James N. Morton, Lemoyne, Pa.; Walter M. Mumma, a member of the U. S. Congress; and Ralph C. Wible of Harrisburg, Pa.

Duke U. and Brunswick Paper Co. Start Hardwood Research Program

A five-year research program in growing and harvesting hardwood forests of the Southeast has been started by Duke University School of Forestry and Brunswick Pulp and Paper Company of Brunswick, Ga., it was announced recently.

A. E. Wackerman, professor of forest utilization, and S. N. Cooper, manager of timberlands for the company, have announced that $15,000, ($3,000 per year) will be made available by the company for the duration of the study. The research will begin this summer.

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These modern Eagle Tree Marking Guns operate easily. A slight thumb pressure on the pump trigger discharges the paint directly to the tree to be marked—good spots as far as 12 feet. Paint sprays freely—amount of paint readily controlled. Non-clogging ball valves—machine cut threads—detachable nozzle—ground brass pump plunger. Easily taken apart for quick cleaning. ¼, 1 and 2 pt. cap.

And, for special numbering jobs, use the Eagle Super#66. A precision pump marking gun—takes undiluted but strained outside paint. Successfully service tested on 40,000 Lake Region trees.

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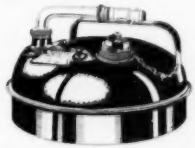
Designed for POWER SAWS and TOOLS



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Forestry Employment

S.A.F. members are privileged to insert one 60-word advertisement in this column without charge. Forest industries desiring to employ foresters may insert advertisements at the rate of $4 per column inch. Copy must be received by the end of this month for an advertisement to appear in the issue after next.

Obviously, the Society cannot assume responsibility beyond making it possible for prospective employee and employer to enter into negotiations.

Positions Available

Graduate forester with at least ten years' experience in forest management and public relations, to direct management centers of the New England Forestry Foundation. Business and executive ability essential. Must live near Boston and spend more than half time in the field. New England experience desirable, but not required. Salary dependent upon experience and ability.
New England Forestry Foundation, 3 Joy St., Boston 8, Mass.

Positions Wanted

Graduate forester, age 37, married with eleven years experience in federal and state forestry agencies. Includes four years experience as forest nursery manager. Navy veteran with 2350 hours flying experience. Desires position with private company in forest industry or commercial nursery field.
Box M, Journal of Forestry, Mills Building, Washington 6, D. C.

Business-management minded forester with broad background, experience, and education seeks administrative connection with industrial concern. Acquainted with wood products possibilities, processes, techniques, and markets. Capable of assisting in executive operations, directing plant research, new product investigations, and plant efficiency improvements. Expect salary commensurate with ability and productivity. General range $600-$700 per month. Approximately twenty years' experience.
Box N, Journal of Forestry, Mills Building, Washington 6, D. C.

Forester, B.S.F., Syracuse University, 1949. Photogrammetry a specialty. 35, married, two children. Recently discharged Army aviator. Experienced in timber management, production, and marketing in Northeast; also administrative experience. Position with a future in U.S. or Canada.
Box O, Journal of Forestry, Mills Building, Washington 6, D. C.

Forester, 34, B.S.F. Ten years' experience in forest economics research, timber surveys, woodland management, and industrial analysis, plus two years in lumber and millwork business. Post graduate training (8 courses) in industrial quality control and marketing. Prefer southeast or south.
Box P, Journal of Forestry, Mills Building, Washington 6, D. C.

Forester, B.S. 1950, experience in federal and state forestry. Desire position with private industry, preferably in Midwest. Experience includes fire control, personnel supervision, forest management, mapping, and public relations. Veteran, age 30, married, one child. References and detailed information upon request. All inquiries welcome.
Box Q, Journal of Forestry, Mills Building, Washington 6, D. C.

Forester, 34, veteran, married, two children; desires employment in Central or Lake States. Four years' Army experience as an instructor. Eight years' forestry experience includes management research, economics research, administration, and public relations in mid-South.
Box R, Journal of Forestry, Mills Building, Washington 6, D. C.

Graduate B.S.F., 40, married, available immediately. Fourteen years' service in Mid-south. Veteran World War II. Experienced in administration, management, fire prevention, reforestation, preservation, and other phases of utilization. Desire employment east of Mississippi River. Would consider teaching.
Box S, Journal of Forestry, Mills Building, Washington 6, D. C.

Graduate forester, 29, married, one child, presently employed as a district forester in midwest. Desires relocation in forestry or related work offering opportunity for advancement. Experience in hardwood timber cruising, marking, and management, reforestation, and in fire control in state and federal work.
Box T, Journal of Forestry, Mills Building, Washington 6, D. C.

Univ. of Fla. to Offer Forest Genetics Short Course

"Forest Genetics, A New Tool For Forest Management," will be the fourth in a group of related short courses given by the University of Florida.

The course, to be offered August 31 through September 4, will be conducted by the General Extension Division of Florida in cooperation with the University of Florida's School of Forestry, the Texas Forest Service and U. S. Forest Service.

The series of courses was begun with "Estimating Pine Timber By Tree Grades," followed by "Forest Site Identification by Soil Characteristics" and "Aerial Photogrammetry."

The instructional fee for this non-credit course is $15.00. Registrations may be made with Fairing, General Extension Division, 707 Seagle Building, Gainesville, Florida.

Yale Announces New Grants; Names of Award Recipients

Establishment of three new grants for research and fellowships; names of recipients of fellowships and scholarship awards for 1953-1954; and the names of nine companies who have contributed to the General Forestry Endowment Fund were announced recently by George A. Garrett, Dean of the Yale School of Forestry.

New Research and Fellowship Grants

The three grants, totaling $210,000, to support research and fellowships for graduate study, are:

The Crown Zellerbach Foundation, of San Francisco, has donated $30,000 to establish a special regional fellowship with preference to be given to graduates of colleges and universities of Oregon and Washington;

The Crossett Lumber Company of Crossett, Ark., the Fordyce Lumber Company of Fordyce, Ark., and several individuals have contributed $80,000 to establish the Ralph C. Bryant Memorial Fund, named for the late Professor Bryant, a member of the Yale forestry faculty from 1906 to 1939;

The Weyerhaeuser Timber Foundation, of Tacoma, Wash., has donated $100,000 to establish the Charles S. Chapman Memorial Fund, named for a member of the first class graduated from the Yale School of Forestry in 1902. Mr. Chapman was one of the first professional foresters employed by the Weyerhaeuser Timber Company, serving from 1924 until his death in 1940.

Award of Fellowships and Scholarships

Three of the fellowships and the four scholarships awarded at Yale were awarded for the first time this year; the three Charles S. Chapman Fellowships just established by the Weyerhaeuser Timber Company, and the four new Ralph C. Bryant Scholarships, established by two southern lumber companies.

The three Chapman fellows are: John D. Downer, Tacoma, Wash.; Joseph L. Shoub, Hazelhurst, Ga.; and Robert L. Youngs, Oregon, Wis.

The four Bryant Scholars are, Robert A. Gregory, Yale Station, New Haven; David A. Rock, Topsfield, Mass.; Frank S. Santamour, Jr., Lowell, Mass.; and William J. Stambaugh, Jersey Shores, Penna.

The remaining six fellowships are:

Charles Boughton Wood Fellowships: Robert F. Krohn, Davis, Calif.; and Jerome P. Tessier, Sudbury, Ontario.

William Henry Sage Fellowships: James H. Brown, Richwood, W. Va.; and Roy D. Whitney, Langdon, Alberta.

Charles W. Goodyear Scholarships: Robert M. Kellogg, Millington, N. J.; and Jack R. Mulholland, Kewanee, Ill.

Donors to the General Forestry Endowment Fund

The nine companies that contributed to the General Forestry Endowment Fund are: Cascade Lumber Co., Yakima, Wash.; Dykes Lumber Co., New York City; Ellensburg Lumber Co., Ellensburg, Wash.; Gaylord Container Corp., St. Louis, Mo.; General Box Company, DesPlaines, Ill.; Naches Box Co., Naches, Wash.; Northwest Paper Foundation, Cloquet, Minn.; St. Paul and Tacoma Lumber Co., Tacoma, Wash.; and the United Shoe Manufacturing Co., Boston.

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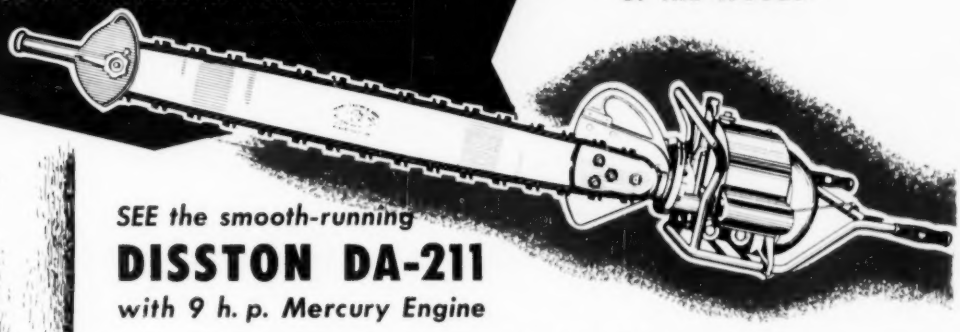
Don't buy any chain saw until you see a DISSTON demonstration

"The Champ of the Woods"



SEE the smooth-running

DISSTON DA-211

with 9 h. p. Mercury Engine

SEE this rugged, reliable worksaver cut and you'll agree there's no job too tough for it! So expertly designed and built it runs at top speed without vibration or chatter.

SEE why it's the undisputed leader for low cost high production cutting of big timber. Meets *every* logging need.

SEE the cutting attachments available which extend the saw's usefulness, including narrow profile guide rails for pulpwood up to seven feet long and 25" Bow Saw attachment.

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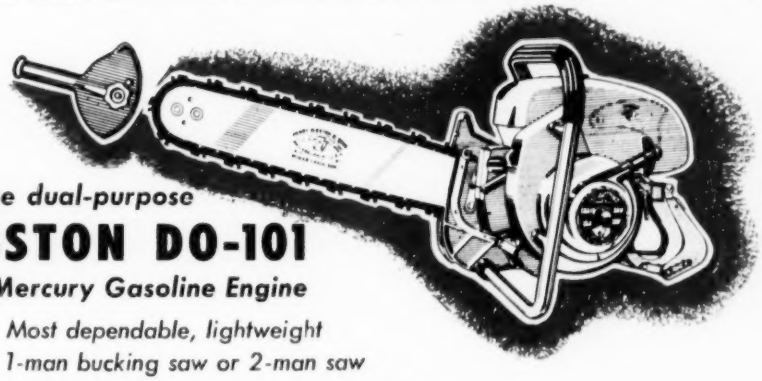
LOW PRICES!

ON ALL DO-101 MODELS



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DISSTON DO-101

with Mercury Gasoline Engine

Most dependable, lightweight 1-man bucking saw or 2-man saw

SEE this amazing saw in action... you'll find it hard to believe! A smooth-running powerhouse that cuts tough logs in seconds. Compact, precision-built Mercury Gasoline Engine keeps it running all day every day.

SEE the many cutting attachments, including: Spee-D-Tach tailstock for quick conversion to 2-man use. A choice of seven rail lengths from 18" to 40".

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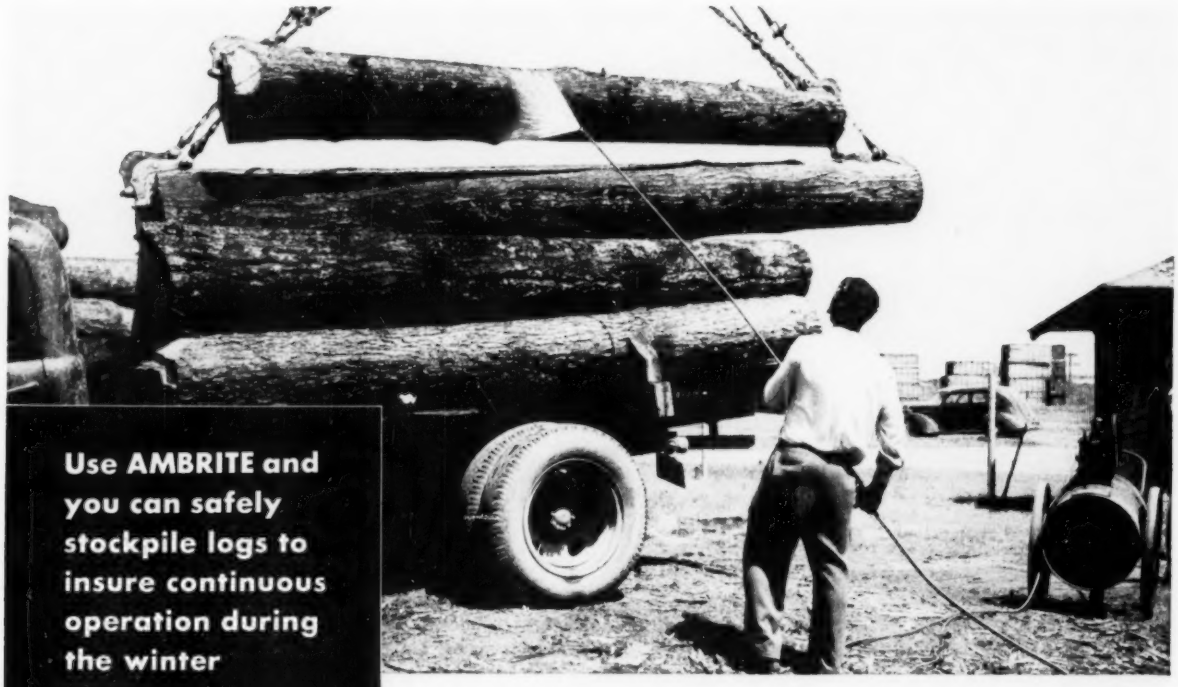
AMBRITE PREVENTS INSECT ATTACK AND STAIN IN LOGS



Use AMBRITE and you can safely stockpile logs to insure continuous operation during the winter

Spraying logs with Chapman AMBRITE at Little Rock Plant of E. L. Bruce Co.

■ It takes only a few minutes' labor and 50c to 75c worth of Chapman AMBRITE to protect a thousand board feet against insect attack, stain and mold. You'll get that small investment back several times over when the lumber is sold . . . because it will be bright and sound instead of stained and wormy.

The effectiveness of Chapman AMBRITE has been demonstrated time after time. Large and small mills, in all sections of the country, are finding it pays to spray hardwood and softwood logs with AMBRITE for protection from insects, stain and mold.

AMBRITE is sold in economical, concentrated form for mixing as used. Applied with inexpensive portable sprayers. Write, wire or phone for prices and recommendations.

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Permatox 10-S for control of sap stain and mold in softwoods and hardwoods.

Ambrocide for use in Permatox 10-S solution to also prevent beetle attacks.

Penta Preservative for pressure and non-pressure treatment of lumber and wood parts.

Seal-Tite for preventing costly end-checking in green timbers.

Weed Killers—a complete line of weed and brush control chemicals for specific jobs.

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